

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO ALL BRANCHES
FIRST SEMESTER
CALCULUS FOR ENGINEERS

(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions**Part-A (10 x 2 =20 Marks)**

1

Prove that at the point $x = \frac{\pi}{2}$ of the curve $y = 4 \sin x - \sin 2x$, $\rho = \frac{5\sqrt{5}}{4}$

2

Write the formula for the centre of curvature.

3

Write the sufficient conditions for a maximum (or) minimum.

4

Find $\frac{du}{dt}$ if $u = x^2 + y^2$, $x = at^2$, $y = 2at$.

5

Evaluate $\int x \sin x dx$

6

Evaluate $\int \frac{dx}{(x+2)^2 - 4}$

7

Evaluate $\int_0^a \int_0^{\sqrt{a^2-x^2}} dx dy$

8

Evaluate $\int_0^1 \int_1^2 x(x+y) dy dx$.

9

Find the unit vector normal to the surface $x^2 - y^2 + z = 2$ at the point $(1, -1, 2)$

10

State Green's theorem in plane

PART-B (5 x 16 = 80)

11 a.

Find the equation to the circle of curvature of the curve $xy = c^2$ at (c, c) **OR**

(P.T.O)

- b. Find the radius of curvature at the point θ on $x = 3a \cos \theta - a \cos 3\theta$ and $y = 3a \sin \theta - a \sin 3\theta$

- 12 a. (i) If $u = \sin^{-1} \frac{x}{y} + \tan^{-1} \frac{x}{y}$, then find the value of $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y}$
 (ii) Find $\frac{du}{dt}$ as a total derivative and verify the result by the direct substitution of $u = x^2 + y^2 + z^2$ when $x = e^{2t}$, $y = e^{2t} \cos 3t$, and $z = e^{2t} \sin 3t$

OR

- b. Find the maximum or minimum value of $f(x, y) = 2 + 2x + 2y - x^2 - y^2$

- 13 a. (i) Evaluate $\int \sqrt{x^2 - 2x - 3} dx$
 (ii) Show that $\int_2^3 \sqrt{(x-2)(3-x)} dx = \frac{\pi}{8}$

OR

- b. (i) Evaluate $\int x \tan^{-1} x dx$
 (ii) Evaluate $\int \frac{e^x(1 + \sin x)}{1 + \cos x} dx$

- 14 a. Evaluate $\int_0^a \int_0^{\sqrt{a^2-x^2}} \int_0^{\sqrt{a^2-x^2-y^2}} \frac{dz dy dx}{\sqrt{a^2-x^2-y^2-z^2}}$

OR

- b. Evaluate $\iint_R r^2 \sin \theta dr d\theta$, Where R is the region above the initial line of the curve $r = 2a \cos \theta$.

- 15 a. Verify Stoke's theorem for $\vec{F} = (x^2 + y^2)\vec{i} - 2xy\vec{j}$ taken around the rectangle bounded by the lines $x = \pm a$, $y = 0$, $y = b$

OR

- b. Evaluate $\iint_S \vec{F} \cdot \hat{n} ds$ where $\vec{F} = z\vec{i} + x\vec{j} - y^2z\vec{k}$ and S is the part of the surface of the cylinder $x^2 + y^2 = 1$ included in the first octant between the planes $z = 0$ and $z = 2$

Sl.No. 1981

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO ALL BRANCHES
FIRST SEMESTER
PHYSICS FOR ENGINEERS

(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 Give the examples for elastic bodies.
- 2 Define: bulk modulus of elasticity
- 3 Give the no. of atoms per unit cell and coordination number for FCC
- 4 What are Miller indices?
- 5 Define: Spontaneous emission
- 6 Write any two applications of CO₂ laser.
- 7 What is meant by critical angle?
- 8 What is multimode fiber?
- 9 What is destructive testing?
- 10 Give the demerits of Liquid Penetrant method.

PART-B (5 x 16 = 80)

- 11 a. Describe an experiment to determine Young's modulus of a beam by uniform bending.

OR

- b. Explain about I-shaped girders with neat diagram.

- 12 a. Determine the number of atoms per unit cell, coordination number, atomic radius and packing factor for BCC structure.

OR

- b. What are Miller indices? Write down the procedure finding the Miller indices with examples.

- 13 a. Explain the applications of lasers in scientific, engineering and industrial fields.

OR

- b. Describe the applications of laser in communication, military and chemical fields.

- 14 a. Describe the characteristics, advantages, disadvantages and applications step-index multimode fibre with necessary diagrams.

OR

- b. Write a note on the following
 i)critical angle, ii) total internal reflection, iii) acceptance angle, iv) numerical aperture.

- 15 a. write down the principle, advantages, disadvantages and applications of ultrasonic flaw detector

OR

- b. Describe the X-ray fluoroscopy technique of nondestructive testing.

**VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)**

B.E DEGREE EXAMINATIONS – NOV/DEC -2018

COMMON TO ALL BRANCHES

First Semester

ENGLISH FOR ENGINEERS

(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time: Three hours

Maximum:100Marks

Answer **ALL** questions

PART – A (10 x 2 = 20 marks)

1. **Identify the parts of speech for the underlined words.**
 - i) We must help ourselves
 - ii) Oh! we are late for the movie

2. **Correct the following sentences by identifying the errors.**
 - i) Do the roses in your garden smell more sweetly than the roses in ours?
 - ii) If you lend him a book, he will lend it to some one else and never you will get it back.

3. **Define the following definitions.**
 - i) Acid ii) Calculator.

4. **Fill in the blanks with suitable articles.**
 - i) I live in ----- apartment
 - ii) I saw ---- movie last night.

5. **Identify the silent letters for the given words.**
 - i) Psychology ii) Doubt

6. **Choose the correct homonyms for the following.**
 - i) The burning candle created a pleasant ____ in the room. Sent, cent, scent.
 - ii) Would you like a piece of fruit? Perhaps a ____? Pear, pair, pare

7. **Choose the correct homophones for the following.**
 - i) She held the ____ in her hand. Reigns, rains, reins
 - ii) He was a medieval _____. Night, knight

8. **Fill in the blanks with appropriate tense form of the verbs.**

SIMPLE PRESENT TENSE

 - i) Every twelve months, the Earth _____ (circle) the Sun.
 - ii) This delicious chocolate_____ (be) made by a small chocolaty in Zurich, Switzerland.

9. Change the following sentences into impersonal passive voice.

- i) The N. S. S. students will clean our campus.
- ii) We can alter the characteristics of steel in various ways.

10. Complete the following sentence:

- i) If there had been no rains last month, _____.
- ii) If he studied hard, _____

PART – B (5 x 16 = 80 marks)

11. a) What are the characteristics of a good listener?

OR

b) State the importance of pronunciation with its guidelines

12. a) What are the points to remember while making a call and receiving a call?

OR

b) As a manager in a company you are asked to write a report of three of your subordinates for promotion. Prepare a report along with your recommendations.

13. a) Describe a memorable incident in your life.

OR

b) Write a note on skimming

14. a) What are the differences between Spoken and Written English?

OR

b) Write the symbols of Vowels. Explain with examples.

15. a) **Read the passage and draw a flow chart.**

The earth contains a large number of metals which are useful to man. One of the most important of these is iron. The iron ore which we find in the earth is not pure. It contains some impurities which we must remove in the earth is not pure. It contains some impurities which we must remove by smelting. The process of smelting consists of heating the ore in a blast furnace with coke limestone and reducing it to metal. Blasts of hot air enter the furnace from the bottom and provide the oxygen which is necessary for the reduction of the ore. The ore becomes molten, and its oxides combine with the limestone to form a liquid slag. This floats on top of the molten iron, and passes out of the furnace through a tap. The metal which remains is pig iron.

We can melt this down again in another furnace-a cupola-with more coke and limestone, and tap it out into a ladle or directly into moulds

OR

b) Write a letter to your friend Ramesh, expressing your sense of relief at his recovery from a serious and long illness

Sl.No. 1598

Sub. Code: 34615101/34616101

VINAYAKA MISSIONS UNIVERSITY, SALEM

B.E. DEGREE EXAMINATION - NOV /DEC – 2018

COMMON TO AUTO, CIVL & MECH

First Semester

ESSENTIALS OF ELECTRICAL AND ELECTRONICS ENGINEERS

(Candidates admitted under 2015&2016 Regulations - CBCS)

Time: Three hours

Maximum: 100 marks

Answer **ALL** questions

Use separate Answer books for Part I and Part II

PART – I: ELECTRICAL ENGINEERING

(50 marks)

PART – A (10 x 2 = 20 Marks)

1. What is Electric Resistance?
2. Mention the SI unit of Area, Volume and Force.
3. Describe Power Factor.
4. What is a DC Motor?
5. Write any two Applications of DC Motors.
6. What is a Commutator?
7. Define Transformer.
8. Write the Working principle of Single Phase Induction Motor.
9. Explain the Step up and Step down Transformer.
10. How Ideal transformers differ from the practical Transformer?

PART – B (3 x 10 =30 Marks)

- 1 . a) Explain the Construction and principle of operation of moving coil Instrument with neat diagram.

OR

- b) Derive the equation of Average value and RMS value of Sinusoidal Waveforms.

2. a) With neat diagram explain the Working Principle of a DC Generator.

OR

- b) Explain the working principle of Three Point DC Starter.

3. a) Enumerate the types of Three Phase transformer connections with suitable diagrams.

OR

- b) Distinguish between Synchronous Motor and Three Phase Induction Motor.

(P.T.O)

PART – II: ELECTRONIC ENGINEERING**(50 marks)****PART – A (10 x 2 = 20 Marks)**

1. Define Passive components.
2. List the classifications of resistors.
3. Compare N-type and P- type Semiconductors.
4. Which configuration of BJT is widely used? Why?
5. Find the 2s complement of the binary number 1011001.
6. Give the truth table of a 2-input XOR gate.
7. Give the truth table of a full adder.
8. Define MODEM.
9. List the most common storage techniques in Video Games.
10. Distinguish between AM and FM.

PART – B (3 x 10 =30 Marks)

11. a) Elaborate the formation of PN junction and its working under No Bias, Forward Bias & Reverse Bias condition. Plot its V-I characteristics curve.

OR

- b) Compare CB, CE & CC configurations of BJT with necessary diagram.

12. a) Explain any four logic gates with truth table and symbol.

OR

- b) Design and explain the working of 4: 1 and 8: 1 Multiplexer with a neat diagram.

- 13 a) Discuss about High Definition TV with diagram.

OR

- b) Elucidate on Satellite Communication system with diagram.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E-DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO ALL BRANCHES
FIRST SEMESTER
ESSENTIALS OF COMPUTER SCIENCE AND ENGINEERING
(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 What is mean by hardware?
- 2 Define Booting.
- 3 Write notes on Bullets and numbering in MS Word.
- 4 Mention the uses of MS Excel.
- 5 List out the way how algorithms may be represented.
- 6 Write an algorithm to find the area of a circle.
- 7 In what way to analyze an algorithm.
- 8 Give an example for top-down analysis.
- 9 List out any four formatting tags in HTML.
- 10 How you define href, target and name Attributes?

PART-B (5 x 16 = 80)

- 11 a. Explain the block diagram of a Computer with neat sketch.

OR

b. Describe the services provided by Internet.
- 12 a. Briefly explain table menu in MS Word.

OR

b. What is a chart and explain different steps for inserting a chart in Excel.
- 13 a. What is flowchart? Explain the symbols used in drawing the flowchart. Also write the rules and advantages of using flowcharts.

OR

b. Write an algorithm and flowchart for generating Fibonacci series.
- 14 a. Discuss the features of an algorithm.

OR

b. Explain the classification of Algorithms.
- 15 a. To create a web page to showing an ordered & unordered list of name of your five friends.

OR

b. Explain in detail about HTML image tags.

VINAYAKA MISSIONS RESEARCH FOUNDATION

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B.E. DEGREE EXAMINATION- NOV /DEC – 2018

COMMONTO AERO, AUTO, CIVIL, ECE, EEE,

EIE, CSE, IT, BME, MECH& & MECT

Second Semester

BUSINESS ENGLISH

(Candidates admitted under 2015&2016 Regulations - CBCS)

Time: Three hours

Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. Correct the following sentences using subject and verb agreement.

- a). He can able to operate the computer.
- b) One of my books are missing.

2. Fill in the blank with suitable prepositions.

- a) They ceased work _____ sunset.
- b) He wrote the answer _____ ink.

3. Combine the sentences showing cause and effect relations.

- a) The machine was tested. It was installed.
- b) He was sick. He went to consult a doctor.

4. Write the meaning for the following phrasal verbs and make sentences of your own.

- a). Break up
- b). Agree with

5. Make your own sentences using the following idiomatic phrases

- a) Catch one's eye
- b) Jack of all trades

6. Write British English words for the following American English words.

- a) Fulfill
- b) Favor

7. Write American English words for the following British English Words.

- a) Litre
- b) Mould

8. Make your own sentences for the following compound words.

- a) Boat house
- b) . Animal behavior.

9. Read the answers and frame the questions.

- a) My father is sixty years old.
- b) I come from Bangkok

10. Find out the stress for the following words.

- a). Before
- b). Television

PART-B (5 x 16 = 80 Marks)

11.a) Write some interpersonal etiquette for negotiation skill.

OR

b) What are the important points to be followed by the e-mail users?

12.a) Write a note on Stress.

OR

Rewrite the following jumbled sentences in the correct order.

- b) i. If that strikes oil, then production wells can be drilled.
 ii. They carry out surveys from the ground and from the air using a variety of instruments.
 And they bore into the rocks to take samples.
 iii. When Petroleum engineers search for oil, they look for certain types of rock layers, or strata, which they know from past experience, can trap oil.
 iv. If it indicates that oil may be present, a test well is drilled.
 v. Oil is found underground trapped in the layers of rock.
 vi. When all the information is collected and analyzed, of the underground strata is obtained.
 vii. They also set off explosions in the ground and record the waves reflected from the underground rock layers.
 viii. This is called seismic surveying.

13.a) Recommendations that should be followed for safety in a factory.

OR

b) Write a set of eight recommendations following which you could avoid the attack of swine flu.

OR

14.a) Write instructions that should be followed in computer Laboratory.

OR

b) Write a letter to the Manager of Sharptronics, Chennai. Calling for quotation for the following items. Assume that you are the purchase officer.

Items	Nos
Blue Star AC	3
Usha fans	7
L G Television 32"	1
L G Refrigerator	1

15.a) Prepare a checklist to find a suitable accommodation for your family.

OR

b) Explain the following Proverbs 'No pain, no gain' and Cleanliness is next to Godliness.

VINAYAKA MISSIONS RESEARCH FOUNDATION
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B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO ALL BRANCHES
SECOND SEMESTER
CHEMISTRY FOR ENGINEERS

(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 Define oxidation and reduction.
- 2 State the reaction when a lead storage battery is recharged?
- 3 Name any two Coagulants.
- 4 What is cathodic protection?
- 5 Why are plastics indispensable in everyday life?
- 6 What is degree of polymerization?
- 7 Define component with example.
- 8 Calculate the degree of freedom for $2 \text{H}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2 \text{H}_2\text{O}(\text{v})$
- 9 Give the frequency region of Infrared spectrum?
- 10 State Retention time.

PART-B (5 x 16 = 80)

- 11 a. Explain the determination of EMF by Poggendorff's method.

OR

- b. Discuss the electrochemical series and its applications.

- 12 a. (i) How is internal treatment of boiler water carried out?
(ii) Describe the principle and method involved in the determination of different types and amount of alkalinity of water.

OR

- b. (i) Differentiate between chemical corrosion and electrochemical corrosion.
(ii) Illustrate the reactions involved in differential aeration corrosion with reference to the iron material.

- 13 a. (a). What are ceramics and how they are classified? Write the uses of ceramics.
(b). Write a note on Special cements.

OR

- b. Write the preparation, properties and uses of the following
(i) PVC (ii) Teflon (iii) Bakelite

(P.T.O)

14 a. With suitable examples explain the terms phase, component and degree of freedom.

OR

b. Write a detail note on harmful effects of radioactive isotopes.

15 a. Describe Gas chromatography with neat diagram.

OR

b. How will you estimate metals by flame photometer?

VINAYAKA MISSIONS RESEARCH FOUNDATION
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B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO ALL BRANCHES
SECOND SEMESTER
C PROGRAMMING

(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 What are the memory requirements of primary data type?
- 2 Mention the various types of operator
- 3 Write the syntax of switch statement.
- 4 Write the Syntax of for statement?
- 5 Find the length of following strings using strlen() function,
char s1[]="program";
char s2[]="importance";
- 6 How to declare a union variable?
- 7 Define library function
- 8 What are the advantages of using a pointer?
- 9 Write the rules for preprocessor directives.
- 10 What is the use of fseek() function?

PART-B (5 x 16 = 80)

- 11 a. Explain the Arithmetic and relational operators in C with suitable program.

OR

- b. Write a C program
- i) To find sum of 5 numbers.
 - ii) To find simple interest.

- 12 a. Explain the types of looping statements?

OR

- b. Write a C program:
- a. i. To find the factorial of a given number using while statement
 - b. ii. To find the factorial of a given number using for statement

- 13 a. Write a C program to explain the concept of structure.

OR

- b. Write a C program to explain the concept of structure within structure.

- 14 a. Discuss the pointer expressions used in the C program.

OR

- b. Write a C program to implement function returning pointers.
- 15 a. Write a C program to altering the allocated memory.

OR

- b. Write about the following function,
 - i. fputs() ii. fgets() iii. fread() iv. fwrite()

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO AUTO AND MECH
THIRD SEMESTER
MATHEMATICS FOR MECHANICAL SCIENCES
(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

1 Obtain the partial differential equation by eliminating arbitrary constants a and b
from $(x-a)^2 + (y-b)^2 + z^2 = 1$

2 Solve $(D^3 - 4D^2D' + 4DD'^2)z = 0$

3 Define Fourier Series

4 In the Fourier series expansion of $f(x) = |\sin x|$ in $(-\pi, \pi)$. What is value of b_n

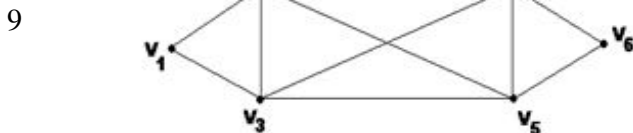
5 Classify the partial differential equation $u_{xx} + xu_{xy} = 0$

6 A string is stretched and fastened to two points l apart, Motion is started by
displacing the string into the form $y = y_0 \sin\left(\frac{\pi x}{l}\right)$ from which it is released at time
 $t = 0$. Formulate this problem as boundary value problem

7 Define Mobius transformation.

8 Define Holomorphic function.

Find the degree of each vertex for the following graph



10 When will you say the graph is self-complementary?

PART-B (5 x 16 = 80)

- 11 a. (i) Solve $z = px + qy + \sqrt{pq}$
 (ii) Solve $pyz + qzx = xy$

OR

- b. (i) Find the general solution of $x(z^2 - y^2)p + y(x^2 - z^2)q = z(y^2 - x^2)$
 (ii) Solve $(D^2 + 4DD'^2 - 5D'^2)z = \sin(x - 2y)$

- 12 a. Obtain the Fourier series to represent the function $f(x) = |x|$, $-\pi < x < \pi$

OR

Find the Fourier series expansion of period 2π for the function $y = f(x)$ which is defined in $(0, 2\pi)$ by means of the table of value given below. Find the series up to the third harmonic

b.

x	0	$\frac{\pi}{3}$	$\frac{2\pi}{3}$	π	$\frac{4\pi}{3}$	$\frac{5\pi}{3}$	2π
y	1.0	1.4	1.9	1.7	1.5	1.2	1.0

A string is stretched between two fixed points at a distance $2l$ apart and the points of the string are given initial velocities v

- 13 a. Where $v = \begin{cases} \frac{cx}{l}, & 0 < x < l \\ \frac{c}{l}(2l - x), & l < x < 2l \end{cases}$

x being the distance from one end point. Find the displacement of the string at any subsequent time

OR

- b. A rod 30cm long has its ends A and B kept at 20°C and 80°C respectively until steady state conditions prevail. The temperature at each end is then suddenly reduced to 0°C and kept so. Find the resulting temperature function $u(x, t)$ taking $x = 0$ at A

- 14 a. Find the bilinear transformation which maps the points $z = -2, 0, 2$ into the points $w = 0, i, -i$ respectively

OR

- b. Find the analytic function $f(z) = u + iv$ if $u + v = \frac{x}{x^2 + y^2}$ and $f(1) = 1$

- 15 a. Prove that a simple graph with n vertices must be connected if it has more than $\frac{(n-1)(n-2)}{2}$ edges

OR

- b. Prove that the element in the i th row and j th column of A^n (n is a nonnegative integer) is equal to the number of paths of length n from the i th vertex to the j th vertex, where $A(G)$ is the adjacency matrix of a digraph G

Sl.No. 1570

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO AUTO AND MECH
THIRD SEMESTER
ENGINEERING THERMODYNAMICS

(Candidates admitted under 2015 &2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 When a system is said to be in thermodynamic equilibrium?
- 2 Prove that for an isolated system there is no change in internal energy.
- 3 State the Kelvin-Planck statement of second law of thermodynamics.
- 4 What are the processes involved in Carnot cycle?
- 5 What is a triple point line in a p-v diagram for water?
- 6 State the two T-ds equations
- 7 State Boyle's law
- 8 Define coefficient of volume expansion.
- 9 What are the ways used to treat the exhaust gas?
- 10 Define specific fuel consumption.

PART-B (5 x 16 = 80)

- 11 a. A boiler produces steam from water at 35°C . The enthalpy of steam is 2675 kJ/kg. Calculate the heat transferred per kg. Specific heat capacity of water is 4.19 kJ/kg. Neglect the potential and kinetic energies.

OR

- b. In a steam power station, steam flows steadily through a 0.2 m diameter pipe line from the boiler to the turbine. At the boiler end, the steam conditions are found to be $p = 4 \text{ Mpa}$, $t = 400^{\circ}\text{C}$, $h = 3213.6 \text{ kJ/kg}$ and $v = 0.073 \text{ m}^3/\text{kg}$. The turbine end the conditions are found to be $p = 3.5 \text{ MPa}$, $t = 392^{\circ}\text{C}$, $h = 3202.6 \text{ kJ/kg}$ and $v = 0.084 \text{ m}^3/\text{kg}$. There is a heat loss of 8.5 kJ/kg from the pipe line. Calculate the steam flow rate.

- 12 a. One kg of air in a closed system initially at 5°C occupying a volume of 0.3m^3 undergoes a constant pressure heating process to 100°C . There is no work other than pdV work. Find the work transfer, heat transfer and the entropy change of the gas.

OR

P.T.O

- b. One kg of ice at -5°C is exposed to the atmosphere which is at 20°C . The ice melts and comes into thermal equilibrium with the atmosphere (i) Determine the entropy increase of the turbine, (ii) What is the minimum amount of work necessary to convert the water back to ice at -5°C ? Assume C_p for ice as 2.093 kJ/kgK and the latent heat of fusion of ice as 333.33 kJ/kg .

- 13 a. A mass of 0.9 kg of steam initially at a pressure of 1.5 MPa and temperature of 250°C expands to 150 kPa . Assume the process is isentropic. Find the condition of steam and work transfer.

OR

- b. Derive the two Tds equations of an ideal gas.
- 14 a. A vessel of volume 0.3 m^3 contains 15 kg of air at 303K . Determine the pressure exerted by the air using 1. Perfect gas equation. 2. Vander waals equation. 3. Generalised compressibility chart. Take Critical temperature of air is 132.8K , Critical pressure of air is 37.7 bar .

OR

- b. A perfect gas of 0.25 kg has a pressure of 298kPa , a temperature of 80°C and a volume of 0.08m^3 . The gas undergoes an irreversible adiabatic process to a final pressure of 350kPa and final volume of 0.10 m^3 , work done on the gas is 25kJ . Find C_p , C_v .
- 15 a. During a trial on a boiler, the dry flue gas analysis by volume was obtained as $\text{CO}_2 = 13\%$, $\text{CO} = 0.3\%$, $\text{O}_2 = 6\%$, $\text{N}_2 = 80.7\%$. The coal analysis by weight was reported as $\text{C} = 62.4\%$, $\text{H}_2 = 4.2\%$, $\text{O}_2 = 4.5\%$, moisture 15% and ash = 13% . Estimate : a). Theoretical air required to burn 1 Kg of dry coal b). Mass of air actually supplied per kg of dry coal c). The amount of excess air supplied per kg of dry coal burnt.

OR

- b. Briefly explain the working principle of Orsat apparatus.

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B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO AUTO, CIVIL AND MECH
THIRD SEMESTER
FLUID MECHANICS AND STRENGTH OF MATERIALS
(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions**Part-A (10 x 2 =20 Marks)**

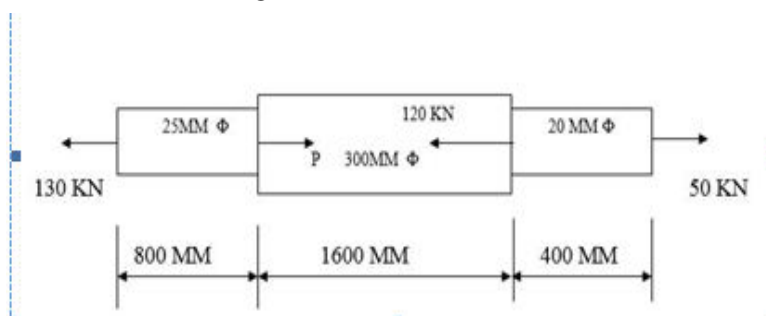
- 1 Define Modulus of rigidity.
- 2 Define Compressive stress and strain
- 3 State the different types of supports.
- 4 A cantilever beam 3 m long carries a load of 20 KN at its free end. Calculate the shear force and bending moment at a section 2 m from the free end.
- 5 In a SSB of 3m span carrying uniformly distributed load throughout the length, the slope at the supports is 10. What is the maximum deflection in the beam.
- 6 State Rankine's formula for crippling load.
- 7 What do mean by the term fluid kinematics?
- 8 What do you understand by convectional acceleration?
- 9 Explain the term streak line.
- 10 State the loss of head due to bend in the pipe.

PART-B (5 x 16 = 80)

- 11 a. Find an expression of the extension in a uniform tapering rod.

OR

- b. Find the value of P and the change in length of each component and the total change in length of the bar shown in Fig. Take $E=200 \text{ KN/mm}^2$



- 12 a. A beam 12m long is supported at two points 2m from each end, So that there are two equal Overhanging portions. It carries concentrated loads of 4kN, 3kN and 5kN at 1m, 8m and 12m respectively from the left end. Draw the SF and BM diagrams. What are the Values of Maximum BM and SF?

OR

- b. A cantilever of length 2m carries a point load of 300N, 500N, and 800N at a distance of 0.5m, 1.2m and 2m from the fixed end. Draw the S.F. and B.M. diagrams for the cantilever.

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- 13 a. A simply supported beam of 8m span carries a point load of 10 kN at its centre. It also subjects to a uniformly distributed load of 1 kN/m over its entire span. Find the maximum deflection of the beam. Take $E = 200 \text{ kN/mm}^2$ and $I = 200 \times 10^6 \text{ N/mm}^4$.

OR

- b. A cantilever beam 4m long carries a load of 50 kN at a distance of 2m from the free end and a load of W at the free end. If the deflection at the free end is 25mm, calculate the magnitude of the load W and slope at free end.
- 14 a. A flat plate of area $1.5 \times 10^6 \text{ mm}^2$ is pulled with a speed of 0.4m/s relative to any other plates located at a distance of 0.15mm from it. Find the force and power required to maintain this speed if the fluid separating them has a viscosity of 1 poise.

OR

- b. Derive the continuity equation in three dimensions.
- 15 a. An orifice meter with orifice diameter 15cm is inserted in a pipe of 30cm diameter. The pressure difference measured by a mercury oil differential manometer on the two sides of the orifice meter gives a reading of 50cm of mercury. Find the rate of flow of oil of specific gravity 0.9 when the coefficient of discharge of the meter is 0.64.

OR

- b. Derive an expression for loss of weight due to friction in a pipe line. [Darcy's formula]

Sl.No. 1528

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
AUTOMOBILE ENGINEERING
THIRD SEMESTER
AUTOMOTIVE PETROL ENGINES

(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 State the classification of heat-engine.
- 2 State the difference between SI and CI engine.
- 3 State the additional systems for the simple carburettor.
- 4 Draw the line diagram of idling jet device.
- 5 What is magneto ignition system?
- 6 What is firing order? Give the firing order of 4 and 6 cylinder engines?
- 7 State the units for viscosity measurement.
- 8 What are the applications of air cooling?
- 9 State the factors used to determine the rate of flame front.
- 10 What do you mean by heterogeneous mixture?

PART-B (5 x 16 = 80)

- 11 a. Explain the Four-stroke petrol engine with neat sketch.
OR
b. Derive the efficiency of Otto cycle.
- 12 a. With a neat sketch explain solex carburettor?
OR
b. Explain the following circuits of solex carburetors Acceleration circuit.
- 13 a. With the help of neat sketch describe the following (a) Ignition coil. (b) Contact breaker.
OR
b. Give a schematic sketch of electrical ignition system of a modern automobile engine.
- 14 a. Explain the following:- i)Hydrodynamic Lubrication. ii)Elasto hydrodynamic Lubrication.
OR
b. Explain the following:- i)Viscosity. ii)Viscosity Index. iii) Cloud Point and Pour Point.
- 15 a. Explain the detonation in the SI Engine.
OR
b. Briefly explain about the abnormal combustion in S.I engines.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E -DEGREE EXAMINATIONS- NOV/DEC - 2018
AUTOMOBILE ENGINEERING
THIRD SEMESTER
AUTOMOTIVE DIESEL ENGINES

(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 Compare two stroke and four stroke diesel engine.
- 2 Write the formula for diesel cycle efficiency?
- 3 Define penetration of the fuel spray.
- 4 What are the merit and demerit of injection system?
- 5 What is meant by combustion chamber?
- 6 Write short notes on knocking in C.I engine?
- 7 What is the function of the rotor compressor?
- 8 State the difference between supercharger and turbocharger?
- 9 State the formula of thermal efficiency of a diesel engine?
- 10 State the effect of Engine speed factors on the performance of engine?

PART-B (5 x 16 = 80)

- 11 a. Explain briefly the Diesel cycle?

OR

- b. In an engine working on the diesel cycle the ratio of the weight of air and fuel supplied is 50:1. The temperature of air at the beginning of the compression is 60° C and the compression ratio used 14:1 what is the ideal efficiency of the engine. Calorific value of fuel is 42000 kJ / kg. Assume $C_p = 1.004$ kJ / kg K and $C_v = 0.717$ kJ / kg K for air.

- 12 a. Explain common rail injection system with neat sketch.

OR

- b. Explain with a neat sketch the working principle of a pneumatic governor?

- 13 a. What is meant by abnormal combustion? Explain the phenomena of knock in CI engine?

OR

- b. Explain the pre- combustion chamber with neat sketch?

- 14 a. Explain in detail how supercharging improves mechanical efficiency?

OR

- b. Briefly explain the construction and operation of the rotary displacement compressor?

- 15 a. What are the methods available for improving performance of a CI engine?

OR

- b. Explain the variables affecting engine performance?

S.No.1028

SUBJECT CODE: 35615303/35616303

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC- 2018
AUTOMOBILE ENGINEERING
THIRD SEMESTER
AUTOMOTIVE ELECTRICAL AND ELECTRONICS SYSTEMS
(Candidates admitted under 2015& 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 Explain in short dry charged battery.
- 2 State the advantage of Zinc-air-battery.
- 3 List out the types of starting motor drive mechanism.
- 4 State the function of brushes in starting motor.
- 5 List out the most common generator faults.
- 6 List the use of high beam in head light?
- 7 Write the application of warning system?
- 8 List the different type of warning system
- 9 Define oxygen sensor
- 10 What is use of coolant temperature sensor?

PART-B (5 x 16 = 80)

- 11 a. Write short notes on following terms: a. Battery voltage.b. Battery capacity.c. Battery life.d. Battery efficiency.

OR

- b. Describe charging procedure.

- 12 a. Explain the solenoid switch and its operation with neat sketch?

OR

- b.

Explain the trouble shooting of starter motor with cause's remedies?

- 13 a. Define generator and explain its principle with neat sketch.

OR

- b. Describe the construction of wind screen wiper.

(P.T.O)

14 a. Explain about electromagnetic compatibility

OR

b. Explain in detail about ECM in EEMS.

15 a. Explain in detail about oxygen sensor used in vehicle with neat sketch.

OR

b. Explain detail about solenoid switch.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO AERO,AUTO,EEE,CIVIL , MECH AND MECT
FOURTH SEMESTER
NUMERICAL METHODS

(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define transcendental equation.

2 When *Gauss-Elimination method* may fail?3 When will you use *Newton's backward interpolation* formula?

4 State Inverse Lagrange's Interpolation Formula.

5

State *Newton's backward interpolation formula* to Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x = x_n$

6 A curve is passing through the points (1,2), (2,1) and (4,5). Find the slope of the curve at $x = 3$

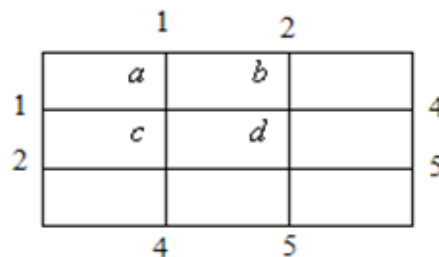
7 Write the formula for the bending moment.

8

Write the solution of the governing equation $\frac{d^2x}{dt^2} = -\mu^2x$ of Simple harmonic motion

9

Given the following mesh, in solving $\nabla^2 u = 0$, Find one set of rough values of u at interior mesh points.



10

In the explicit formula for solving one dimensional wave equation given the equation if $\lambda^2 = \frac{1}{a^2}$, what is the simplest form to explicit scheme?

PART-B (5 x 16 = 80)

11 a.

Evaluate $\sqrt{12}$ to four decimal places by *Newton - Raphson* method

OR

b.

Find the inverse of a matrix $\begin{bmatrix} 2 & 1 & 1 \\ 3 & 2 & 3 \\ 1 & 4 & 9 \end{bmatrix}$ by Gauss Jordan method.

12 a.

Using Newton's Forward Interpolation Formula, Find the value of $\sin 47^\circ$ given that

$\sin 45^\circ = 0.7071$, $\sin 50^\circ = 0.7660$, $\sin 55^\circ = 0.8192$, and $\sin 60^\circ = 0.8660$.

OR

b.

Using Newton's divided difference formula, Find the value of $f(8)$ from the following table.

x	4	5	7	10	11	13
y	48	100	294	900	1210	2028

13 a.

Find the first two derivatives of y at $x = 54$ from the following data.

x	50	51	52	53	54
y	3.6840	3.7084	3.7325	3.7563	3.7798

OR

b.

Evaluate $I = \int_0^1 \frac{dt}{1+t}$ by Gaussian two point and three point formula. Find a boundary for the error in three point formula and compare it with true error

14 a.

Using the Runge-Kutta method, tabulate the solution of the system $\frac{dy}{dx} = x + z$, $\frac{dz}{dx} = x - y$, $y(0) = 0$, $z(0) = 1$, $h = 0.1$. Find $y(0.1)$, $y(0.2)$, $z(0.1)$ and $z(0.2)$.

OR

b.

Given $\frac{dy}{dx} + y - x^2 = 0$, $y(0.2) = 0.8213$, Find $y(0.3)$ correct to four decimal places using Modified Euler's method.

15 a.

Solve $xy'' + y = 0$, $y'(1) = 0$ and $y(2) = 1$ with $h = 0.5$

OR

b.

Solve the Poisson equation $\nabla^2 u = -81xy$, $0 < x < 1$; $0 < y < 1$ and $u(0, y) = u(x, 0) = 0$; $u(x, 1) = u(1, y) = 100$ with the square mesh of size $h = \frac{1}{3}$.

Sl.No. 2010

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO AUTO AND MECH
FOURTH SEMESTER
DISASTER MITIGATION AND MANAGEMENT
(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 What is disaster phase?
- 2 Define disaster management
- 3 Write a brief note on the extra planetary hazards.
- 4 Define return period.
- 5 Define risk assessment.
- 6 What is risk management?
- 7 List out the kinds of trauma after disaster.
- 8 Define funding in Disaster management.
- 9 Write a short note on mitigation planning.
- 10 What is NDMA?

PART-B (5 x 16 = 80)

- 11 a. Explain in detail the causes of any four types of disaster.
OR
b. Explain the factors affecting the disaster
- 12 a. What determines the severity of a hazard?
OR
b. Explain the damage due to earthquake.
- 13 a. Enumerate the process of risk management.
OR
b. Discuss in detail the various Awareness programmes in Disaster Management.
- 14 a. Define logistic management?
OR
b. What is meant by Standard Operating Procedure?
- 15 a. Describe the organizational structure for disaster management in India.
OR
b. Discuss the role of technology in disaster management.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO AUTO ,MECH AND MECT
FOURTH SEMESTER
MANUFACTURING ENGINEERING

(Candidates admitted under 2015 &2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 Mention the names of various casting process?
- 2 Why draft allowance is important for pattern?
- 3 Mention the advantages of forging process over foundry process.
- 4 Define stretching.
- 5 How do you specify the shaping machine?
- 6 What is indexing?
- 7 How do you classify a welding process?
- 8 Mention the differences between oxy hydrogen welding and oxy acetylene welding.
- 9 List the unconventional machining process which uses mechanical energy?
- 10 Define the term "Chemical Ablation".

PART-B (5 x 16 = 80)

- 11 a. Discuss centrifugal casting process with neat sketches. What are all its merits, demerits and applications?

OR

- b. Listing the casting defects explain the causes and remedies with necessary sketches.

- 12 a. Describe the various types of Extrusion process with neat sketch?

OR

- b. Explain the various types of sheet metal forming process with neat sketch.

- 13 a. Draw a neat sketch of lathe and explain its various parts.

OR

- b. Explain any six operations performed on drilling machines, with neat sketch.

- 14 a. Explain the working principle of TIG welding. With neat sketch?

OR

- b. Explain with a neat sketch submerged arc welding process?

- 15 a. Explain the working principle of electrochemical discharge grinding and discuss the Process capabilities?

OR

- b. Explain ECG with neat sketch

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E-DEGREE EXAMINATIONS- NOV/DEC - 2018
AUTOMOBILE ENGINEERING
FOURTH SEMESTER
MECHANICS OF MACHINES

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 What is meant by kinematic chain?
- 2 Define relative velocity of two bodies.
- 3 What do you understand by gear trains?
- 4 List out the applications of epicyclic gear train.
- 5 What is meant by slope of thread?
- 6 Sketch and name the types of wire ropes.
- 7 Differentiate a flywheel from a governor.
- 8 Define force law of equilibrium and momentum law of equilibrium.
- 9 What do you mean by a degree of freedom?
- 10 Write the expressions for Damping factor and Damping frequency.

PART-B (5 x 16 = 80)

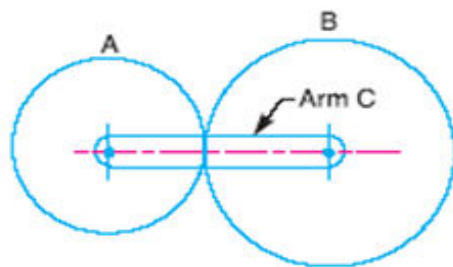
- 11 a. In a four bar chain ABCD, AD is fixed and is 150mm long. The crank AB 40mm long and rotates at 120r.p.m. clockwise, while the link CD = 80mm oscillates about D. BC and AD are of equal length. Find the angular velocity of link CD when angle BAD=60°.

OR

- b. A cam is to be designed for a knife-edged follower from the following data:
- a) Cam lift = 40mm during 90° of cam rotation with simple harmonic motion.
 - b) Dwell for the next 30°
 - c) During the next 60° of cam rotation, the follower returns to its original position with simple harmonic motion
 - d) Dwell for the remaining 180° of cam rotation. Draw the profile of the cam when the line of stroke of the follower passes through the axis of the cam shaft.
- 12 a. The following data relate to a pair of 20° involute gear in module=6mm, number of teeth on pinion=17, number of teeth on gear=49; Addenda on pinion and gear wheel =1 module. Find
- i) The number of pair of teeth in contact,
 - ii) The angle turned through by the pinion and the gear wheel when one pair of teeth is in contact, and
 - iii) The ratio of sliding to rolling motion when the tip of a tooth on the large wheel just making contact

OR

- b. In an epicyclic gear train, an arm carries two gears A and B having 42 and 58 teeth respectively. If the arm rotates at 215 r.p.m. in the anticlockwise direction about the centre of the gear A which is fixed, determine the speed of gear B. If the gear A instead of being fixed makes 365 r.p.m. in the clockwise direction, what will be the speed of gear B?



- 13 a. Derive an expression for the torque transmitted by a single plate clutch assuming
 i) Uniform pressure
 ii) Uniform wear.

OR

- b. An open belt drive connects two pulleys 1.2 m and 0.5 m diameter, on parallel shafts 4 metres apart. The mass of the belt is 0.9 kg per metre length and the maximum tension is not to exceed 2000 N. The coefficient of friction is 0.3. The 1.2 m pulley, which is the driver, runs at 200 r.p.m. Due to belt slip on one of the pulleys, the velocity of the driven shaft is only 450 r.p.m. Calculate the torque on each of the two shafts, the power transmitted, and power lost in friction. What is the efficiency of the drive?
- 14 a. A petrol engine has a stroke of 120mm and connecting rod is 3 times the crank length. The crank rotates at 1500 r.p.m clockwise direction. Determine i) Velocity and accelerations of the pistons, ii) Angular velocity and angular accelerations of the connecting rod, when the piston has travelled one-fourth of its stroke from IDC.

OR

- b. The lengths of crank and connecting rod of a horizontal reciprocating engine are 200 mm and 1.0 m respectively. The crank is rotating at 400 r.p.m. When the crank has turned 30° from the inner dead centre, the difference of pressure between the cover end and piston end is 0.4N/mm^2 . If the mass of the reciprocating parts is 100kg and cylinder bore is 0.4m, then calculate:
 i) Inertia force,
 ii). Force on piston,
 iii). Piston effort,
 iv). Thrust on the sides of cylinder walls,
 v) Thrust in the connecting rod,
 vi) Crank – effort.

- 15 a. The three cranks of a cylinder locomotive are all on the same axle and are set at 120° . The pitch of the cylinder is 1 meter and the stroke of each piston is 0.6 m. The reciprocating masses are 300 kg for inside cylinder and 260 kg for each outside cylinder and the planes of rotation of the balance masses are 0.8 m from the inside crank. If 40% of the reciprocating parts are to be balanced, find: The magnitude and the position of the balancing masses required at a radius of 0.6 m and the hammer blow per wheel when the axle makes 6 rps.

OR

- b. A shaft of 100 mm diameter and 1 m long is fixed at one end and the other end carries a flywheel of mass of 500 kg at a radius of gyration of 450 mm. The modulus of rigidity for the shaft material 80 GN/m². Find the frequency of torsional vibration

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO AUTO AND MECH
FOURTH SEMESTER
DISASTER MITIGATION AND MANAGEMENT
(Candidates admitted under 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 What is response phase?
- 2 Describe volcano
- 3 Write a brief note on the extra planetary hazards.
- 4 Describe SWOT analysis of disaster.
- 5 Write the role of public awareness in risk reduction
- 6 Discuss about mock drill?
- 7 What are the two committees that control funds?
- 8 What are the minimum standards of relief?
- 9 Write a short note on drought preparedness.
- 10 State the vision of NDMA

PART-B (5 x 16 = 80)

- 11 a. Explain in detail the causes of any four types of disaster.
OR
b. Explain
a) types of threats
b) Drought preparedness and mitigation
- 12 a. What determines the severity of a hazard?
OR
b. Explain about capacity and its dimensions.
- 13 a. Enumerate the process of risk management.
OR
b. Explain in detail about Trigger Mechanism.
- 14 a. Define logistic management?
OR
b. List out the evacuation techniques of casualties from disaster area.
- 15 a. Describe the organizational structure for disaster management in India.
OR
b. Narrate National Policy on Disaster Management

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
AUTOMOBILE ENGINEERING
FOURTH SEMESTER
MECHANICS OF MACHINES
(Candidates admitted under 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 State Grashof's laws for a four bar mechanism.
- 2 Distinguish normal component of acceleration and tangential component of acceleration.
- 3 Define backlash in gears.
- 4 Define pitch of gear?
- 5 What are the types of pivot bearing?
- 6 In what ways the clutches are differed from brakes?
- 7 Differentiate a flywheel from a governor.
- 8 Define applied force and constrained force.
- 9 Give some applications of a V engine.
- 10 Write the expressions for Damping factor and Damping frequency.

PART-B (5 x 16 = 80)

- 11 a. In a four bar chain ABCD, AD is fixed and is 150mm long. The crank AB 40mm long and rotates at 120r.p.m. clockwise, while the link CD = 80mm oscillates about D. BC and AD are of equal length. Find the angular velocity of link CD when angle BAD=60°.

OR

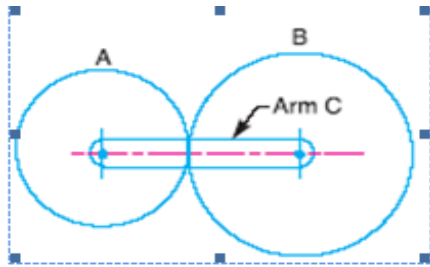
- b. A cam rotating with clockwise with a uniform speed is to give the roller follower of 20mm diameter with the following motion
- (i) Follower to move outwards through a distance of 30 mm during 120° of cam rotation,
 - (ii) Follower Dwell for the remaining 60° of cam rotation
 - (iii) Follower to return to initial position during 90° of cam rotation.
 - (iv) Follower Dwell for the remaining 90° of cam rotation.
- The minimum radius of cam 45 mm, The outstroke of the follower is performed with simple harmonic motion both outward and return stroke. Draw the profile of the cam when the line of stroke of the follower passes through the axis of the cam shaft.
- 12 a. The following data relate to a pair of 20° involute gear in module=6mm, number of teeth on pinion=17, number of teeth on gear=49; Addenda on pinion and gear wheel =1 module. Find i) The number of pair of teeth in contact,
ii) The angle turned through by the pinion and the gear wheel when one pair of teeth is in contact, and
iii) The ratio of sliding to rolling motion when the tip of a tooth on the large wheel just making contact

OR

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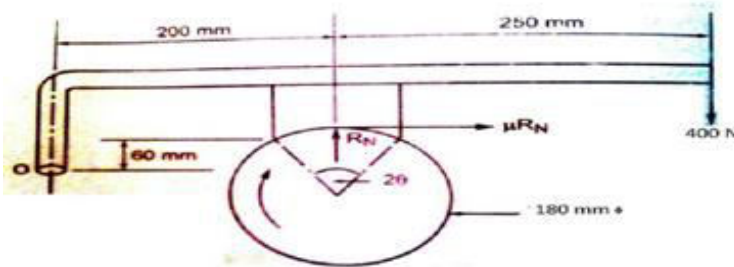
- b. In an epicyclic gear train, an arm carries two gears A and B having 42 and 58 teeth respectively. If the arm rotates at 215 r.p.m. in the anticlockwise direction about the centre of the gear A which is fixed, determine the speed of gear B. If the gear A instead of being fixed makes 365 r.p.m. in the clockwise direction, what will be the speed of gear B?



- 13 a. Derive an expression for the torque transmitted by a single plate clutch assuming

OR

- b. A single block brake is shown below. The diameter of the drum is 180 mm and the angle of contact is 60° . If the operating force of 400N is applied at the end of a lever and the coefficient of friction between the drum and the lining is 0.30. determine
- The torque that may be transmitted by the block brake,
 - The rate of heat generated during the braking action, when the initial brake speed is 300 r.p.m, and
 - The dimensions of the block if the intensity of pressure between the block and brake drum is 1 N/mm^2 . The breadth of the block is twice its width.



- 14 a. A petrol engine has a stroke of 120mm and connecting rod is 3 times the crank length. The crank rotates at 1500 r.p.m clockwise direction. Determine i) Velocity and accelerations of the pistons, ii) Angular velocity and angular accelerations of the connecting rod, when the piston has travelled one-fourth of its stroke from IDC.

OR

- b. A horizontal steam engine running at 210 r.p.m has a bore of 190 mm and stroke of 350mm. The piston rod is 20mm in dia and connecting rod length is 950mm. The mass of the reciprocating parts is 8 kg and the frictional resistance is 350 N. Determine the following when the crank is at 115° from the IDC the mean pressure being 4500 N/m^2 on the cover side and 100 N/m^2 on the crank side. (i) Thrust on connecting rod (ii) Thrust on cylinder walls (iii) load on the bearings and (iv) Tuning moment on the crank shaft.

- 15 a. The three cranks of a cylinder locomotive are all on the same axle and are set at 120° . The pitch of the cylinder is 1 meter and the stroke of each piston is 0.6 m. The reciprocating masses are 300 kg for inside cylinder and 260 kg for each outside cylinder and the planes of rotation of the balance masses are 0.8 m from the inside crank. If 40% of the reciprocating parts are to be balanced, find: The magnitude and the position of the balancing masses required at a radius of 0.6 m and the hammer blow per wheel when the axle makes 6 rps.

OR

- b. A machine mounted on spring and filled with a dashpot has a mass of 100 kg. There are four springs, each of stiffness 25 KN/m. The amplitude of vibrations reduces from 40 mm to 10 mm in three complete oscillations. Assuming that the damping force varies as the velocity, determine: (a) the resistant of dashpot at unit velocity, (b) the ratio of frequencies of damped and undamped vibrations, and (c) the periodic time of damped vibrations.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
AUTOMOBILE ENGINEERING
FIFTH SEMESTER
COMBUSTION THERMODYNAMICS AND HEAT TRANSFER
(Candidates admitted under 2015&2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 State fuel air ratio.
- 2 Define convective flames.
- 3 State Boyle's law.
- 4 State Hess's law.
- 5 State the compression ratio on flame propagation.
- 6 State disintegration of jet.
- 7 Define ignition delay period.
- 8 Define the controlled combustion.
- 9 What is an indirect Injection system?
- 10 State motoring.

PART-B (5 x 16 = 80)

- 11 a. Explain the premixed laminar flames and also its structure, temperature profile, concentration profile in detail.

OR

- b. Explain in detail the types of diffusion flames obtained with various flow rates of fuel and air.

- 12 a. Explain with neat sketch, the various types of combustion chamber used in CI engine.

OR

- b. Derive an equation for the following by methods of constant pressure combustion process.
- i) Mass conservation.
 - ii) Chemical equilibrium.
 - iii) Energy conservation.
 - iv) Constant volume combustion.

- 13 a. What is meant by abnormal combustion? Explain the phenomena of knock in SI engine?

OR

- b. Why is flame speed important? What is most important single factor effecting flame speed?

- 14 a. What is delay period and what are the factors that affect it

OR

- b. Mention the various parameters which affect the engine heat transfer and explain the effect.

- 15 a. Explain in detail the photographic studies of combustion process?

OR

- b. What are the advantages of over head valve combustion chamber over side valve combustion chamber? And also discuss the types of over head combustion chamber.

Sl.No. 1515

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
AUTOMOBILE ENGINEERING
FIFTH SEMESTER
AUTOMOTIVE FUELS AND LUBRICANTS
(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions**Part-A (10 x 2 =20 Marks)**

- 1 Why there is a need of high molecular weight hydro carbonscracking?
- 2 What is the demerit of solvent extraction process?
- 3 Classify crankcase mechanical friction.
- 4 What is co-efficient of friction?
- 5 What is the function of Oxidation Inhibitor?
- 6 What are the effects of engine conditions of lubricating oil?
- 7 What do you mean by flame spread rate?
- 8 Define Latent heat of vaporization
- 9 Name the factors that influence the flame speed.
- 10 What are the types of open combustion chamber?

PART-B (5 x 16 = 80)

- 11 a. Write short notes on (a) isomerisation, (b) polymerisation.
OR
b. Explain Dubbs thermal cracking process in detail
- 12 a. Explain the mechanism of lubrication in detail.
OR
b. Briefly explain the SAE rating of lubricants.
- 13 a. Explain the different types of lubricants.
OR
b. Explain the production and use of synthetic lubricants.
- 14 a. Explain the tests to determine the vapour pressure of fuel.
OR
b. Write short notes on determination of (A) Aniline point, (B) Specific gravity.
- 15 a. Explain abnormal combustion of SI engine in detail.
OR
b. Draw neat sketch and explain the types of In-direct injection combustion chamber.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
AUTOMOBILE ENGINEERING
FIFTH SEMESTER
ELECTIVE - ADVANCED PRODUCTION PROCESSES FOR
AUTOMOTIVE COMPONENTS

(Candidates admitted under 2015& 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 Define the term blending?
- 2 What are the three steps in heat treatment process?
- 3 What are the basic forging operations?
- 4 What are the advantages of hydro forming process?
- 5 Mention different methods for manufacturing of gears.
- 6 List the gear generating process.
- 7 What is the purpose of Automatic Tool Changer?
- 8 Explain absolute and incremental system.
- 9 Explain drap forming.
- 10 What are the advantages of transfer moulding?

PART-B (5 x 16 = 80)

- 11 a. Explain the utility and application of secondary processes in powder metallurgy.
OR
b. What are the primary and secondary process, used for processing of metal powders? Explain the secondary process operations.
- 12 a. Explain the working principle of explosive forming process with a neat sketch. List its advantages, applications and limitations.
OR
b. Explain the working principle of wire and tube drawing processes with neat sketches.
- 13 a. Why is gear finishing required? Discuss the various types of gear finishing operations.
OR
b. Sketch a typical broach and indicate important elements.
- 14 a. Write briefly about open loop, closed loop and adaptive control systems in CNC machine tool.

OR

(P.T.O)

b. How is cutter compensation given in the case of a machining centre? Explain it with an example.

15 a. Describe the plunger type injection moulding process for producing plastic components.

OR

b. Explain with a neat sketch of direct squeeze casting?

Sl.No. 1046

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
AUTOMOBILE ENGINEERING
FIFTH SEMESTER
AUTOMOTIVE ENGINE COMPONENTS DESIGN
(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions**Part-A (10 x 2 =20 Marks)**

- 1 Write down the factors influencing machine design.
- 2 What are the methods to reduce stress concentration?
- 3 What is the significance of slenderness ratio in shaft design?
- 4 What is shear stress correction factor according to the Wahl's hypothesis?
- 5 State the material used for cylinder liners.
- 6 State the various stresses acting on the piston.
- 7 What are the functions of connecting rod assembly?
- 8 Draw the diagram of balancing centrifugal inertial forces in a double cylinder engine.
- 9 State the types of valve gear.
- 10 State the design consideration of exhaust manifold.

PART-B (5 x 16 = 80)

- 11 a. Explain the factor affecting selection of materials.
OR
b. Briefly explain the following.
 - a) Stress concentration Factor
 - b) Notch sensitivity
- 12 a. A solid shaft is to transmit 1000 kW at 120 rpm. Find the shaft diameter if the design shear stress is 80 N/mm². If the shaft is made hollow with internal diameter as 0.6 times the outside diameter, find the percentage of saving in material.
OR
b. A gas engine valve spring is to have a mean diameter of 37.5mm. The maximum load which will have to sustain is 450 N with a corresponding depletion of 12.5 mm. the spring is to be made of tempered wire. Since the material is to be subjected to repeated loading and the fatigue must be considered a low working stress of 3000 N/mm². Find the size for wire and number of coils used. Take rigidity modulus as 0.8×10^5 N/mm².
- 13 a. Draw a neat diagram for piston and explain design aspects.
OR

- b. From data of heat, speed characteristic and dynamic analysis cylinder 'D'=78mm, 'S'=stroke=78mm, actual max pressure of combustion $P_{zmax} = P_{za} = 6.195 \text{ Mpa}$ @ $n_N = 3200 \text{ rpm}$, Piston area $F_p = 47.76 \text{ cm}^2$, Max rated force $N_{max} = 0.0044 \text{ MN}$ @ $\Phi = 370^\circ$, mass of piston group ' m_p ' = 0.478kg, Engine idling speed $n_{idmax} = 6000 \text{ rpm}$, no of oil passages $n_o = 10$, diameter of oil passages ' d_o ' = 1mm, $\lambda = 0.285$, $\alpha_p = 22 \times 10^{-6} \text{ 1/K}$, the cylinder liner is of cast iron, $\alpha_{cyl} = 11 \times 10^{-6} \text{ 1/K}$. Assume related dimensions find
- Bending stress
 - Compression stress
 - Rupture stress
 - Combined stress on the top ring land.
 - Piston specific pressure exerted on cylinder wall
 - Diameter clearances of piston crown and skirt diameters in a hot state.

- 14 a. Explain the step by step procedure for designing the connecting rod shank.

OR

- b. Referring to dynamic analysis and design of connecting rod small end, R (crank radius) = 0.039m, shell wall thickness $t_s = 2 \text{ mm}$, Distance between connecting rod bolts $C_b = 62 \text{ mm}$, big end length $l_c = 26 \text{ mm}$, crank pin diameter $d_{cp} = 48 \text{ mm}$, mass piston assembly $m_p = 0.478 \text{ kg}$, mass of connecting rod assembly $m_{cr} = 0.716 \text{ kg}$. Angular velocity $\omega_{idmax} = 628 \text{ rad/s}$, $\lambda = 0.285$.
- find maximum inertia force.
 - Resisting moment of design section.
 - Shell and cap inertia moments.
 - Bending stress of cap and shell.

- 15 a. Write the step by step procedure for design of the valve train

OR

- b. With neat sketch explain the following mechanisms.
- Over head valve mechanism,
 - Side valve mechanism

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
AUTOMOBILE ENGINEERING
FIFTH SEMESTER
AUTOMOTIVE TRANSMISSION

(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 What are the resistances considered to automotive propulsion
- 2 What is fluid coupling?
- 3 Which is the driving number and driver number in a torque converter?
- 4 What do you mean by coupling point in two phase torque converter?
- 5 Why is it called as planetary gearbox?
- 6 Mention some of the properties to be satisfied for the working fluid in hydrodynamic drive.
- 7 What are the major elements in Chevrolets Turbo glide transmission
- 8 When a planet gear train set to be in neural?
- 9 What are the disadvantages in hydro static drive?
- 10 How reversion of drive is achieved in Ward Lenard control system?

PART-B (5 x 16 = 80)

- 11 a. Mention some of the troubles of gear box and their causes.

OR

 b. A sliding mesh gear box has gear ratios in forward speed 1.0, 1.6, 2.6 and reverse speed as 3.15. The smallest gear should have at least 12 teeth with D_p 4mm, center distance 84mm. Calculate the number of teeth in all gears and exact gear ratios.
- 12 a. Discuss the Hydrodynamic transmission in detail.

OR

 b. Explain the principle and operation of torque converter using polar diagram
- 13 a. Explain Wilson gear box with neat sketch.

OR

 b. Derive the gear ratios of different gears in Wilson gear box.
- 14 a. Explain about the automatic transmission and list out the advantages and disadvantages?

OR

 b. Explain about different hydraulic components.
- 15 a. Discuss with hydrostatic transmission with suitable diagram.

OR

 b. Explain the circuit diagram of the Early ward Leonard control system.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
AUTOMOBILE ENGINEERING
FIFTH SEMESTER
MODERN VEHICLE TECHNOLOGY

(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 List the requirements of the battery for electric vehicles.
- 2 Write down about the solar powered vehicles
- 3 Give any two types of stratified charge engine.
- 4 List the disadvantages of HCCI engines
- 5 Name a pressure sensor used in computer control of engine noise.
- 6 How information technology plays the role in vehicle speed control?
- 7 Write the essential components of road networking.
- 8 Define Intelligent Transport Systems.
- 9 Give the merits and demerits of collapsible steering wheel.
- 10 What is closed loop suspension?

PART-B (5 x 16 = 80)

- 11 a. Discuss about high energy and power density batteries.
OR
b. Write down the merits and demerits of hybrid vehicles
- 12 a. Explain the working and principle of lean burn engine.
OR
b. Explain the construction and working of HCCI engine with a neat sketch.
- 13 a. Explain with a schematic diagram the working of object detection system.
OR
b. Explain the advantages of computer control of noise in detail.
- 14 a. With relevant sketches explain the construction and working of automated road network.
OR
b. Explain the satellite control of vehicle safety and stability with neat sketches.
- 15 a. Explain the air suspension system in detail with a neat schematic diagram.
OR
b. Explain the necessity and advantages of regenerative braking in detail.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
AUTOMOBILE ENGINEERING
SIXTH SEMESTER
VEHICLE BODY ENGINEERING

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 What is separate body and chassis?
- 2 Define Roo bar.
- 3 Define pitching moment.
- 4 What are the effects of side wings?
- 5 Write the advantage of conventional type construction.
- 6 What is meant by a luxury coach?
- 7 Classify commercial vehicles.
- 8 Mention the advantages of flat platform body.
- 9 What are the materials used for the vehicle body construction?
- 10 What is Resin?

PART-B (5 x 16 = 80)

- 11 a. Explain the visibility regulation and visibility aspects
OR
b. Describe with neat sketches various safety, equipments used in passenger car.
- 12 a. Explain how aerodynamic forces and movements can be measured by a wind Tunnel testing.
OR
b. Explain scale model testing and its types.
- 13 a. Indicate the sep by step procedure in bus body construction.
OR
b. Explain the classification of bus bodies with suitable diagrams.
- 14 a. Explain the types of heavy commercial vehicle bodies with diagrams.
OR
b. Explain tipper body construction with the help of a neat sketch.
- 15 a. Explain the following
 - (1) characteristics of automobile paints
 - (2) Under coat paint
 - (3) Top coat paint**OR**
b. Explain the elements of paint in detail with block diagram.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
AUTOMOBILE ENGINEERING
SIXTH SEMESTER
AUTOMOTIVE CHASSIS COMPONENTS DESIGN
(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions**Part-A (10 x 2 =20 Marks)**

- 1 What are the functions of clutch?
- 2 What are the advantages in using design software?
- 3 What is meant by tractive effort?
- 4 What are the advantages of synchromesh gearbox?
- 5 What is the classification of suspension system?
- 6 Define independent suspension system.
- 7 What are the various steering geometry parameters?
- 8 What is the purpose of a knuckle head?
- 9 Define planet gear.
- 10 What are the types of propeller shaft?

PART-B (5 x 16 = 80)

- 11 a. An automobile power unit gives a maximum torque of 13.56N-m. The clutch is of a single plate dry disc type, having effective lining on both sides of the plate disc. The coefficient of friction is 0.3 and the maximum axial pressure is 8.29×10^4 Pa and the external radius of the friction surface is 1.25 times the internal radius. Calculate the dimensions of the clutch plate and the total axial pressure that must be exerted by the clutch springs.

OR

- b. A centrifugal clutch is to transmit 25.5Pw at 750rpm when engaged at 75% of the running speed. The inside dia is 0.36m and the radial distance of the C.G of each shoe from the shaft axis is 0.15m. Assuming $\mu = 0.3$, determine the weight of each shoe of the clutch.

- 12 a. Describe Synchromesh gearbox with a neat sketch.

OR

- b. With the help of suitable sketches explain the sliding mesh gear box.

- 13 a. Explain construction of suspension systems in commercial vehicles.

OR

- b. Explain with the help of neat sketches different types of leaf springs.

- 14 a. Determine the optimum dimensions and proportions for steering linkages.

OR

- b. Derive equation for to find the bearing loads at the king pin.

- 15 a. What are the types of rear axle? Explain any two types.

OR

b. Explain and draw the three quarter floating rear axle.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
AUTOMOBILE ENGINEERING
SIXTH SEMESTER
AUTOMOTIVE POLLUTION CONTROL
(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions**Part-A (10 x 2 =20 Marks)**

- 1 What is adiabatic flame temperature?
- 2 What is meant by green house effect?
- 3 What are the design variables affecting the emission of SI engine?
- 4 Expand ELCD.
- 5 What is reason formation black smoke in engine?
- 6 Define smoke unit.
- 7 Define crushing.
- 8 What is thermal reactor?
- 9 What is Indian driving cycle?
- 10 State the purpose of chassis dynamometer.

PART-B (5 x 16 = 80)

- 11 a. What are the different types of pollution caused by an automobile? Explain.
OR
b. Discuss the effect of CO, HC, NO x and smoke emission affecting human and biological life.
- 12 a. Explain modern evaporative emission control system.
OR
b. Explain NO x formation in SI engine emission.
- 13 a. Explain the effect of operating variables affecting in CI engine on emission.
OR
b. Explain the formation of other emissions from CI engine.
- 14 a. Explain diesel particulate Trap.
OR
b. Explain electronic engine management system for control of pollution.
- 15 a. Discuss particulate emission measurements.
OR
b. Explain the test procedure for ECE.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- APR/MAY - 2019
AUTOMOBILE ENGINEERING
SIXTH SEMESTER
ENGINE AND VEHICLE MANAGEMENT SYSTEMS
(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions**Part-A (10 x 2 =20 Marks)**

- 1 What is an open loop system?
- 2 What is meant by look up tables?
- 3 List down the liquid level sensors.
- 4 What is the use of crash sensor?
- 5 Write the advantage of sequential injection techniques
- 6 What is the need for cold start and warm up phases in fuel injection system?
- 7 What is meant by electronically controlled Unit Injection system?
- 8 What is meant by retarded post injection?
- 9 List the applications of vehicle tracking system.
- 10 Write notes on collision avoidance radar warning system

PART-B (5 x 16 = 80)

- 11 a. What is the difference between Open Loop Control and Closed loop Control System?

OR

- b. What is meant by a look up table and how it is used in engine control?

- 12 a. Write short notes on: (i) Throttle position sensor (TPS), (ii) Crankshaft position sensor (CKP)

OR

- b. Explain the construction and working of a sensor based on piezo electric effect and its application in a car

- 13 a. Discuss the various components of any one electronic engine management system of SI engine in detail.

OR

- b. Explain about electronic ignition system.

- 14 a. Discuss the Fuel injection system parameters affecting combustion, noise and emissions in CI engines

OR

- b. Write short notes on the EGR valve and list the merits and demerits of the same.

- 15 a. Explain working of air bag system with neat diagram

OR

- b. Explain cruise control system.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E-DEGREE EXAMINATIONS- NOV/DEC - 2018
AUTOMOBILE ENGINEERING
SEVENTH SEMETER
ALTERNATIVE ENERGY SOURCES FOR AUTOMOBILES
(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 What are the major countries for proven oil reserves?
- 2 Write short notes on vegetable oil.
- 3 Differentiate SI and CI engine.
- 4 What is E85?
- 5 What are the undesirable properties of hydrogen?
- 6 What is gas chromatograph?
- 7 Compare the properties of coconut and peanut oil.
- 8 Write the disadvantages of vegetable oils used in engines as fuel.
- 9 What is the range per charge for EVs?
- 10 Write the components used in hybrid vehicles.

PART-B (5 x 16 = 80)

- 11 a. Explain alcohol as alternate fuel for SI engines, Bringing out their merit and demerits.

OR

- b. List out merits and demerits of LPG.
- 12 a. What are the effects of alcohol blended fuels on the emission and field performance of two stroke and four stroke engine?

OR

- b. Compare the characteristics of Alcohol is used for CI engine
- 13 a. Explain the production process of hydrogen fuel and explain the performance characteristics of hydrogen fuel.

OR

- b. Discuss the performance and emission characteristics of CNG as engine fuel.
- 14 a. Discuss the performance and emission characteristics of SVO as engine fuel.

OR

- b. Discuss the properties of biodiesel, how it can be as alternate fuel?
- 15 a. Explain the advantages and disadvantages of solar powered vehicles.

OR

- b. What are the advantages and disadvantages of using high energy batteries in hybrid vehicles?

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
AUTOMOBILE ENGINEERING
SEVENTH SEMESTER
EMBEDDED ENGINE AND MANAGEMENT SYSTEMS
(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions**Part-A (10 x 2 =20 Marks)**

- 1 What are the three types of configuration in transistors?
- 2 What are the types of ADC and DAC
- 3 Briefly explain the basic principle of strain gauge load cell.
- 4 Define Knock sensors.
- 5 What is meant by a controller?
- 6 Briefly explain Oxidation Catalyst.
- 7 What are the important requirements of fuel injection system
- 8 What is meant by unit injector system?
- 9 What is the basics requirement for spark ignition?
- 10 What are advantage of 12 V ignition system

PART-B (5 x 16 = 80)

- 11 a. Explain the construction of Bipolar Junction Transistor and its types.

OR

b. Write the logic symbol, expression and truth table for following logic gates:
(i)EX-OR (ii) NOR (iii) XNOR
- 12 a. Explain in detail the construction and how karmen vortex works.

OR

b. Explain any three sensors used for temperature measurements.
- 13 a. How does the computer adjust the engine's idle speed?

OR

b. Explain Throttle body injection with neat sketch
- 14 a. State the different types of nozzle used in fuel injector. Explain the different types of nozzle with neat sketch.

OR

b. Explain with layout Electronically controlled injection pump with neat sketch.
- 15 a. Explain solid state ignition system with neat sketch

OR

b. What are the important requirements of the high voltage ignition source for the spark ignition process?

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
AUTOMOBILE ENGINEERING
SEVENTH SEMESTER
TWO AND THREE WHEELER TECHNOLOGY
(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions**Part-A (10 x 2 =20 Marks)**

- 1 What is the purpose of gasket?
- 2 What is use of reed valve in a two stroke petrol engine?
- 3 What is the function of fuel injection pump?
- 4 List out the components of starting system.
- 5 Define monocoque frame.
- 6 Define double cradle frame?
- 7 Define wheel cylinder.
- 8 What is purpose of breaks?
- 9 Distinguish between Moped and Motor cycle.
- 10 Why clutch linkage adjustment is required?

PART-B (5 x 16 = 80)

- 11 a. Sketch and explain the scavenging processes used in two wheeler engine.
OR
b. Explain in the important of port timing diagrams in IC engine.
- 12 a. With neat sketch explain the starting system of a 2wheeler.
OR
b. Explain the following i. Capacitive Discharge Ignition. ii. Transistorised Assisted Ignition system.
- 13 a. With neat sketch explain the any one type of two wheeler gearbox.
OR
b. With neat sketch explain about sliding mesh gear box.
- 14 a. Briefly explain about the Classifications of Brakes.
OR
b. Explain With neat sketch construction and working of air braking system.
- 15 a. With help of suitable sketches explain the operational techniques of any one company moped.
OR
b. Draw the layout of three wheeler and mark its parts along with their functions.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
AUTOMOBILE ENGINEERING
SEVENTH SEMESTER
VEHICLE MAINTENANCE

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 Distinguish between preventive and breakdown maintenance.
- 2 How to prepare the check list?
- 3 What is meant by top overhauling?
- 4 What is a hydrometer and how can it to be used?
- 5 What is the importance of the maintenance of propeller shaft?
- 6 What do you mean by front end geometry and how they can be measured?
- 7 What are the probable causes for non-function of an electric horn of a car?
- 8 What are the different tests conducted to check the DC generator?
- 9 What is meant by pumping of oil?
- 10 What is a thermostat and what are the failures you expect in a thermostat?

PART-B (5 x 16 = 80)

- 11 a. Explain various types of records, books and forms that are being used in an automotive service station of cars.

OR

- b. Explain scheduled maintenance along with its documents, and general servicing that are carried out during first servicing of a car.

- 12 a. What is the procedure for testing connecting rod for bend and twist? How valve clearance is adjusted in a four cylinder engine?

OR

- b. Discuss about the visual inspection and reconditioning work procedure for cylinder block and piston.

- 13 a. Explain the different methods used for wheel balance. Describe the wheel alignment for a tubeless tyre.

OR

- b. Explain any four troubles experienced in hydraulic brake system and explain how these troubles can be rectified.

- 14 a. Describe briefly the causes for the troubles of (1) head light (2) Stop lights (3) parking lights?

OR

- b. Describe briefly the various methods of battery testing

(P.T.O)

15 a. Give a brief account of servicing of oil and fuel filter; State some of the special tools and equipments necessary for a garage.

OR

b. Explain the procedure in oil servicing and maintenance?

Sl.No. 1331

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
AUTOMOBILE ENGINEERING
SEVENTH SEMESTER
VEHICLE TRANSPORT MANAGEMENT
(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 What are the responsibilities of HRM?
- 2 What is apprentice training?
- 3 List out the forms of ownership.
- 4 Write the principal function of traffic.
- 5 List out various types of fare collecting method.
- 6 What is third party insurance?
- 7 List out few rules of motor vehicle act.
- 8 What is road worthy certificate?
- 9 What are the safety precautions to be made during the maintenance of a vehicle?
- 10 Differentiate between the terms “Servicing” and “Maintenance”.

PART-B (5 x 16 = 80)

11 a. Explain the components of Wages.

OR

b. Explain the types of Wage Payment and its merits and demerits.

12 a. Explain the chain of responsibility in motor system.

OR

b. Explain the principal function of engineering divisions.

13 a. Explain the fare tables in passenger transport.

OR

b. Draw the layout of garage and depot for goods transport vehicle and explain the same in detail.

14 a. Explain the procedure for registration of vehicle.

OR

b. Explain the issue of driving licence and eligibility for getting driving licence.

15 a. Explain various types of records, books and forms that are being used in an automotive service station of cars.

OR

b. Discuss briefly about Chassis lubrication and the workshop facilities for diesel transport vehicles maintenance.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC- 2018
ELECTIVE - AUTOMOTIVE SAFETY
AUTOMOBILE ENGINEERING
SEVENTH SEMESTER

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 What is safety sandwich construction?
- 2 What are the advantages of locating the central and mid engine.
- 3 Give the merits and demerits of collapsible steering wheel.
- 4 Mention any two example for active safety
- 5 Give the demerits of tiltable steering wheel
- 6 Give the demerits of collapsible steering column.
- 7 What is electronic visibility?
- 8 What is meant by front vehicle object detection
- 9 What are the advantages of central locking system?
- 10 What is meant by ventilation in a vehicle

PART-B (5 x 16 = 80)

- 11 a. Describe the techniques used to enhance the visibility of the driver of a passenger car.?
OR
b. Explain in details the various aspects of designing a passenger car body for safety.
- 12 a. Briefly explain active and passive safety systems in automobile.
OR
b. Give the broad classification of active safety systems and explain them in detail.
- 13 a. Explain the construction and working principles of collapsible steering column.
OR
b. With a schematic diagram explain the concept of bumper design for safety.
- 14 a. Name the various gadgets used for collision warning and explain the working of any two them.
OR
b. Explain in detail frontal object detection system with a neat sketch.
- 15 a. Describe the features of central locking, rain sensor system with a neat sketch.
OR
b. What is G.P.S? How this system enhances the convenience of a passenger car?
