Biotechnology

Part –B (35X1=35)

1. Minerals do not include
   a) Calcium
   b) Sodium
   c) Iodine
   d) Iron

2. Which of the following is a protein source of plant origin?
   a) Egg
   b)Soyabean
   c) Cheese
   d) Milk

3. The highest concentration of minerals are found in
   a) Bones and teeth
   b)Skin and muscle
   c) Arms and legs
   d) Stomach and liver

4. Our body needs ____ litres of water every day.
   a) 1/2
   b) 2-3
   c) 7-8
   d) 10-12

5. The component of food which help our body to fight against infections is
   a) Proteins
   b) Fats
   c) Carbohydrates
   d) Starch

6. What is the term used for the automated in vitro testing of large numbers of compounds using genetically modified cells?
   a) Robotic testing
   b) High throughput screening
   c) Multiscreening
   d) Nanotechnology

7.What type and thickness of shielding is generally used for Sulphur 35

a) 1 mm lead
b) No shielding at all
c) 1 mm Paper
d) Concrete

8. Which of the following would be attracted toward a positively charged sheet of metal?

a)Alpha particle
b)Beta particle
c)Gamma ray
d)Delta particle

9 What is the unit of absorbed dose?

a) Joule
b) Sievert
c) Gray
d) Becquerel

10 Which of these would not be a valid reason that use of microarray technology to differentiate between closely related bacterial species and subspecies is important?

a) Certain strains of bacteria are more pathogenic than other related strains.
b) Some strains of bacteria are more active in bioremediation than other related strains.
c) Infection by different strains of bacteria may require different therapeutic approaches.
d) In many cases, critical information about characteristics of a bacterium causing an infection needs to be immediately available.

11. The DNA microarrays technology that indicates which genes are transcribed is called _____.

a)DNA variation screening
b)Gene expression profiling
c)Microarray comparative genomic hybridization
d) Antisense

12 .Replication proceeds in a ---------- direction

a) From 5' to 3' end
b) The 3' end
c) The 5' end
d) 3' to 5' end

13. Expand CTAB

a) Cetylbismonthyl ammonium bromide
b) Cetyltriammonical Bromide
c) Ceasiumtrimethy ammonium bromide
d) Cetyltrimethylammonium bromide

14 .The β' subunit of polymerase has a function of _____

a) Promoter binding
b) Elongation
c) Cation binding
d) Termination

15. The bacterial system has _____ RNA polymerases.

a) 1
b) 2
c) 3
d) 4

16 .What is the consensus sequence of the Pribnow box?

a) TATATA
b) TATAAT
c) TAATA
d) TTAAT

17 .Which of the following RNA polymerases are responsible for the production of 5S rRNA?

a) RNA polymerase I
b) RNA polymerase II
c) RNA polymerase III
d) RNA polymerase IV

18. With respect to the subunits of ribosome which of the following is wrongly paired?

a) Ribosome = rRNA + protein
b) Large subunit = decoding center
c) Small subunit = decoding center
d) Subunit sedimentation unit = Svedberg

19. How many channels are present in the ribosome?

a) 2
b) 3
c) 4
d) 5

20 .Which part of the ribosome identifies the Shine – Dalgarno sequence?

a) Protein
b) 16S rRNA
c) 23S rRNA
d) 5S rRNA

21. Which element of the ribosome plays the key role in mRNA translation?
    a) rRNA of the large subunit
    b) Proteins of the large subunit
    c) rRNA of the small subunit
    d) Proteins of the small subunit

22. With respect to tRNA which of the following is not its characteristic?
    a) Complimentary region
    b) Double helix molecule
    c) Highly conserved pattern of fold
    d) Variable loop

23 .What is the angle between the D loop and the anticodon loop?
    a) 45˚
    b) 90˚
    c) 135˚
    d) 180˚

24 .In the beads on a string model, the bead is made up of _____
    a) 6 histone proteins
    b) 8 histone proteins
    c) 6 histone proteins and DNA
    d) 8 histone proteins and DNA

25. How many types of histone molecules are found in nature?
    a) 3
    b) 4
    c) 5
    d) 6

26 .The culturing of cells in liquid agitated medium is called _____
    a) Liquid culture
    b) Micropropagation
    c) Agar culture
    d) Suspension culture

27. Batch Cultures are type of suspension culture where
    a) Medium is continuously replaced
    b) Medium is loaded only at the beginning
    c) No depletion of medium occurs
    d) Cellular wastes are continuously removed and replaced

28. Immobilized cell bioreactors are based o
    a) Cells cultured in solid media
    b) Cells cultured in liquid media
    c) Cell entrapped in gels
    d) Cell liberated in gels

29 .Animal cell cultures are used widely for the production of
    a) Insulin
    b) Somatostatin
    c) mabs
    d) thyroxine

30 The virus commonly used to infect cell cultures for the production ofinterferon is
    a) Corona virus
    b) Sendai virus
    c) Polio virus
    d) Small pox virus

31. The cell line used for the production of polio vaccine was
    a) Primate kidney cell line
    b) CHO cell line
    c) Dog kidney cell line
    d) mouse fibroblast cell line

32. The technique used in animal biotechnology for the rapid multiplication andproduction of animals with a desirable genotype is
    a) Protoplast fusion and embryo transfer
    b) Hybrid selection and embryo transfer
    c) In vitro fertilization and embryo transfer
    d) In vivo fertilization and embryo transfer

33. Which of the following enzyme is used to join two DNAmolecule
    a) Nuclease
    b) Restriction enzymes
    c) Lyases
    d) Ligases

34. Which of the following is an RNA dependent DNA synthetase
    a) DNA polymerase I
    b) DNA polymerase II
    c) Reverse transcriptase
    d) Forward transcriptase

35. Which is the enzyme used to remove phosphate group fromthe 5' end of the DNA
    a) Restriction enzymes
    b) Alkaline phosphatase
    c) Polynucleotide kinase
    d) Ribonuclease H

Civil Engineering

Part –B (35X1=35)

1. Wrought iron contains carbon up to
a) 0.25%
b) 1.0%
c) 1.5%
d) 2%

2. Pick up the polymineralic rock from the following
a) Quartz Sand
b) Pure Gypsum
c) Magnesite
d) Granite

3. The ratio of 5 day BOD to ultimate BOD is about
a) 1/3
b) 2/3
c) 3/4
d) 1.0

4. Which aquatic animal was released on a large scale in the Ganga to rid it of waste flesh?
a). Gharial
b). Turtle
c). Dolphin
d). Fishes

5. Salmon was caught in this river after 60 years in 1974 when it was cleansed of pollution after intensive research. Which is the river?
a). Ganga
b). Thames
c). Nile
d). Angara

6. Which of the following groups of plants can be used as indicators of SO pollution of air?
a) Epiphytic lichens
b) Ferns
c) Liver worms
d) Horn worms

7. Which of the following on inhalation dissolved in the blood haemoglobin more rapidly than oxygen?
a) Sulphur dioxide
b) Carbon mono-oxide
c) Ozone
d) Nitrous oxide

8) Ultimate strength to cement is provided by
a) Tricalcium silicate
b) Di-calcium silicate
c) Tri-calcium aluminate
d) Tetra calcium alumino ferrite.

9. The major photochemical oxidant is:
a) Ozone
b) Hydrogen peroxide
c) Nitrogen oxides
d) Peroxyl Acetyl Nitrate (PAN)

10. Elastomers can extend up to
a) Five times their original dimensions
b) Seven times their original dimensions
c) Ten times their original dimensions
d) Three times their original dimensions.

11. Pick up the hypabyssal rock from the following:
a) Granite
b) Dolerite
c) Basalt
d) Marble

12) If h is the difference in level between end points separated by l, then slope correction is $\frac{h^2}{2l} + \frac{h^4}{8l^3}$. The second term may be neglected if the value of h in a 20 m distance is less than

a) 4m
b) 2m
c) 1.5m
d) 3m

13. The radius of curvature of the arc of the bubble tube is generally kept
a) 10 m
b) 25 m
c) 50 m
d) 100 m

14. Taj Mahal at Agra may be damaged by:
a) Sulphur dioxide
b) Chlorine
c) Hydrogen
d) Oxygen

15. If S is the length of a sub chord and R is the radius of simple curve, the angle of deflection between its tangent and sub-chord, in minutes, is equal to
a) 573 S/R
b) 573R/S
c) 171.9 S/R
d) 1718.9 S/R.

16. Offsets are measured with an accuracy of 1 in 40. If the point on the paper from both sources of error (due to angular and measurement errors) is not to exceed 0.05 cm on a scale of 1 cm = 20 m, the maximum length of offset should be limited to
a) 14.14m
b) 28.28 m
c) 200 m
d) 250m

17.The bearings of the lines AB and BC are 146° 30' and 68° 30'. The included angle ABC is
a) 102°
b) 78°
c) 45°
d) 35°.

18. Fluoride pollution mainly affects:
a) Kidney
b) Brain
c) Heart
d) Teeth

19. In a liquid limit test, the moisture content at 10 blows was 70% and that at 100 blows was 20%. The liquid limit of the soil, is
a) 35%
b) 50%
c) 65%
d) 75%

20. The active earth pressure of a soil is proportional to (where φ is the angle of friction of the soil)
a) tan (45° - φ)
b) tan2 (45° + φ/2)
c) tan2 (45° - φ/2)
d) tan (45° + φ)

21. The coefficient of compressibility of soil, is the ratio of
a) Stress to strain
b) Strain to stress
c) Stress to settlement
d) Rate of loading to that of settlement

22. Back fill with a sloping surface exerts a total active pressure Pa on the wall of height H and acts at
a) H/4 above the base parallel to base
b) H/2 above the base parallel to base
c) H/3 above the base parallel to base
d) H/5 above the base parallel to base.

23. At a given instant ship A is travelling at 6 km/h due east and ship B is travelling at 8 km/h due north. The velocity of B relative to A is
a) 7 km/hrs
b) 2 km/hrs
c) 1 km/hrs
d) 10 km/hrs

24. Sound becomes hazardous noise pollution at decibels:
a) Above 80
b) Above 30
c) Above 100
d) Above 120

25. The locus of the instantaneous centre of a moving rigid body, is
a) Straight line
b) Involute
c) Centroid
d) Spiral

26. The highest heating value is of:
a) Garbage
b) Rubbish
c) Hospital waste
d) Industrial waste

27. The maximum area of tension reinforcement in beams shall not exceed
a) 0.15%

b) 1.5%
c) 4%
d) 1%

28. An R.C.C. beam not provided with shear reinforcement may develop cracks in its bottom inclined roughly to the horizontal at
a) 25°
b) 35°
c) 45°
d) 55°

29. The minimum cube strength of concrete used for a prestressed member, is
a) 50 kg/cm^2
b) 150 kg/cm^2
c) 250 kg/cm^2
d) 350 kg/cm^2

30. Design of a two way slab simply supported on edges and having no provision to prevent the corners from lifting, is made by
a) Rankine formula
b) Marcus formula
c) Rankine Grashoff formula
d) Grashoff formula

31. Design of R.C.C. simply supported beams carrying U.D.L. is based on the resultant B.M. at
a) Supports
b) Mid span
c) Every section
d) Quarter span.

32. To design a cross-over between parallel tracks, the required components are :
a) Two switch, points, two acute angle crossings and two check rails
b) Two switch points, two acute angle crossings and four check rails
c) Two switch points, two acute angle crossings and six check rails
d) Two switch points, two acute angle crossings and eight check rails

33. The three primary soil macronutrients are
a) Carbon, oxygen, and water.
b) Copper, cadmium, and carbon.
c) Potassium, phosphorus, and nitrogen.
d) Boron Zinc and manganese

34. Which gas out of following is found highest by volume in Air?
a) Nitrogen
b) Oxygen
c) Ozone
d) Methane

35. Which stage of vehicle emission norms presently applicable in India in Internal Combustion Engine?
a) BS IV
b) BS V
c) BS III
d) BS II

CSE

Part –B (35X1=35)

1. Which of the following is NOT an Oracle-supported trigger?
   a) BEFORE
   b) DURING
   c) AFTER
   d) INSTEAD OF

2. Triggers _____ enabled or disabled
   a) Can be
   b) Cannot be
   c) Ought to be
   d) Always

3. What type of join is needed when you wish to include rows that do not have matching values?
   a) Equi-join
   b) Natural join
   c) Outer join
   d) All of the mentioned

4. Which of the following schemas does define a view or views of the database for particular users?
   a) Internal schema
   b) Conceptual schema
   c) Physical schema
   d) External schema

5. Given a system made up of a logic L with a proof system that can produce ONLY True sentences expressible in L, which of the following is (necessarily) true?

   a) The system is Sound and Complete
   b) The system is Sound but may not be Complete
   c) The system is Complete but may not be Sound
   d) The system may neither be Sound nor Complete

6. Which of the following is equivalent to the statement "If it rains, then the match will be cancelled."?

a) If it does not rain, then the match will not be cancelled.
b) If the match is cancelled, then it rained.
c) If the match is not cancelled, then it did not rain.
d) If it did not rain, the match will be cancelled.

7. Network architecture has a stack of layers. Which of the following is not true for this architecture?

a) Different layers can be developed separately
b)Layers internals are independent
c)Network protocols cannot work with multiple layers
d) A device can handle one or more layers as per requirement

8. How many headers and trailers are added by transport layer in TCP/IP protocol suit?

a)1 header and 2-3 trailers
b)1 header and no trailer
c)2-3 headers and no trailers
d)Undefined

9. Which of the followings state correct differences between a switch and a hub?
i. Switch transmit a signal to all the devices connected to it, hub transmit a signal only to the intended port
ii. Switch works in physical layer, hub works at data-link layer
iii. Switch works at layer 2 while hub works at layer 1
iv. Switch is a smart device, whereas hub is a dumb device

a) I & II
b) II & III
c) III & IV
d) IV & I

10. In which cryptosystem, the order of the letters in a message is rearranged

a) Transpositional Cipher
b) Substitution Cipher
c) Both (A) and (B)
d) None of the mentioned

11. The Data Encryption Standard (DES) uses a key generator to generate sixteen _____ bit roundkeys.

a) 32
b) 48
c) 54
d) 42

12. Which operation is used in the Fiestel cipher?

a) AND
b) OR
c) XOR
d) NOR

13. Which of the following are classification problems? (multiple options may be correct)
a) Predicting the amount of rain fall for a particular day.
b) Predicting whether it will rain or not on a particular day.
c) Given all the actors in a movie, predicting its genre.
d) Filtering of spam messages.

14. Which one of the following is not a symptom of the present software crisis:
a) Software is expensive.
b) It takes too long to build a software product.
c) Software is delivered late.
d) Software products are required to perform very complex tasks.

15. Which one of the following is not an implication of severely restricted size of the short–term memory?
a) Difficulty in permanently remembering large amount of information.
b) Difficulty in developing a program with large number of variables
c) Difficulty in debugging a program with large number of variables
d) Difficulty in understanding a program with large number of variables

16. _____refers to the biases, noise and abnormality in data, trustworthiness of data.
a) Value
b) Veracity
c) Velocity
d) Volume

17. What are the main components of Hadoop Ecosystem?
    a) MapReduce, HDFS, YARN
    b) MLlib, GraphX
    c) Gelly, Table, CEP
    d) None of the mentioned
18. Which of these statements is NOT TRUE?
    a) MQTT is a publish-subscribe protocol
    b) MQTT is a client-server protocol
    c) MQTT is a lightweight messaging protocol
    d) MQTT is used in conjunction with TCP/IP
19. Channel hopping is performed at which HART layer?
    a) Physical
    b) Data link
    c) Network
    d) Application
20. WBAN stands for:
    a) Wireless Buffer Area Networks
    b) Wireless Body Area Networks
    c) Wired Body Area Networks
    d) Wired Buffer Area Networks
21. Which of the following is not true of depth-first search (DFS) starting at a vertex v?
    a) DFS identifies all vertices reachable from v.
    b) Using an adjacency list instead of an adjacency matrix can improve the worst case complexity.
    c) DFS will identify the shortest paths from v in any graph without edge weights.
    d) DFS numbering can be used to identify cycles in the graph.
22. What will be the output of the following C code?

```
#include <stdio.h>
int main()
        {
int x = 2, y = 0;
int z = (y++) ? y == 1 && x : 0;
printf("%d\n", z);
return 0;
        }
```

    a) 0
    b) 1
    c) Undefined behaviour
    d) Compile time error

23. What would be the size of the following union declaration? (Assuming size of double = 8, size of int = 4, size of char = 1)

```
#include <stdio.h>
        unionuTemp
                {
        double a;
        int b[10];
        char c;
        }u;
```

a) 4
b) 8
c) 40
d) 80

24. SELECT name ____ instructor name, course id
FROM instructor, teaches
WHERE instructor.ID= teaches.ID;
Which keyword must be used here to rename the field name?
a) From
b) Rename
c) As
d) Join

25. SELECT name
FROM instructor
WHERE dept name = 'Physics'
ORDER BY name;
By default, the order by clause lists items in _____ order.
a) Descending
b) Any
c) Same
d) Ascending

26. A bottom up parser generates
a) Right most derivation
b) Rightmost derivation in reverse
c) Leftmost derivation
d) Leftmost derivation in reverse

27. A source program is usually in _____

a) Assembly language
b) Machine level language
c) High-level language
d) Natural language

28. The small extremely fast, RAM's are called as _____

a) Cache
b) Heaps
c) Accumulators
d) Stacks

29. To extend the connectivity of the processor bus we use _____

a) PCI bus
b) SCSI bus
c) Controllers
d) Multiple bus

30. Remote Procedure Calls are used :

a) for communication between two processes remotely different from each other on the same system
b) for communication between two processes on the same system
c) for communication between two processes on separate systems
d) None of the mentioned

31. The remote method invocation :

a) allows a process to invoke memory on a remote object
b) allows a thread to invoke a method on a remote object
c) allows a thread to invoke memory on a remote object
d) allows a process to invoke a method on a remote object

32. The interval from the time of submission of a process to the time of completion is termed as

a) waiting time
b) turnaround time
c) response time
d) throughput

33. An expression involving byte, int, and literal numbers is promoted to which of these?
    a) int
    b) long
    c) byte
    d) float

34. Which one of the following contains date information?
    a) java.sql.TimeStamp
    b) java.sql.Time
    c) java.io.Time
    d) java.io.TimeStamp

35. Which of the following is used to call stored procedure?
    a) Statement
    b) PreparedStatement
    c) CallableStatment
    d) CalledStatement

ECE

Part –B (35X1=35)

01. For a dipole antenna

(a)The radiation intensity is maximum along the normal to the dipole axis

(b)The current distribution along its length is uniform irrespective of the length

(c)The effective length equals its physical length

(d)The input impedance is independent of the location of the feed –point

02. The radiation resistance of a circular loop of one turn is 0.01Ω. The radiation resistance of five turns of such a loop will be

(a)0.002 Ω

(b)0.01 Ω

(c)0.05 Ω

(d)0.25 Ω

03. In a double side-band (DSB) full carrier AM transmission system, if the modulation index is doubled, then the ratio of total sideband power to the carrier power increases by a factor of _____

(a) Factor of 4

(b) Factor of 3

(c) Factor of 5

(d) Factor of 7

4. Which of the following analog modulation scheme requires the minimum transmitted power and minimum channel band-width?

(a)VSB

(b)DSB-SC

(c)SSB

(d)AM

05. A bandlimited signal is sampled at the Nyquist rate. The signal can be recovered by passing the samples through

(a)an RC filter

(b)an envelope detector

(c)a PLL

(d)an ideal low-pass filter with the appropriate bandwidth

06. A 1.0 KHz signal is flat top sampled at the rate of 1800 samples/sec and the samples are applied to an ideal rectangular LPF with cut-off frequency of 1100 Hz, then the output of the filter contains

(a) only 800 Hz component

(b) 800 Hz and 900 Hz components

(c) 800 Hz and 1000 Hz components

(d) (d)800 Hz, 900 Hz and 100 Hz components

07. An image uses 512×512picture elements. Each of the picture elements can take any of the 8 distinguishable intensity levels. The maximum entropy in the above image will be

(a) 2097152 bits

(b)786432 bits

(c) 648 bits

(d) 144 bits

08. In CE configuration the output V-I characteristics are drawn by taking

(a)V_{CE} vs.I_C for constant value of I_E

(b) V_{CE}vs.I_C for constant value of I_B

(c) V_{CE}vs.I_C for constant value of V_{CB}

(d) V_{CE} vs V_{CB}

09. Leakage current in CE configuration is

(a) very high
(b) very small
(c) normal
(d) not present

10. In VLSI design, which process deals with the determination of resistance & capacitance of interconnections?

(a) Floorplanning
(b) Placement & Routing
(c) Testing
(d) Extraction

11. Which among the following is an output generated by synthesis process?

(a) Attributes & Library
(b) RTL VHDL description
(c) Circuit constraints
(d) Gate-level net list

12. Which abstraction level undergo the compilation process by converting a sequential program into finite-state machine and register transfers while designing an embedded system?

(a) System
(b) Behaviour
(c) RT
(d) Logic

13. Which unit in 80386 DX architecture plays a crucial role in the conversion of linear address to physical address?

(a) Execution
(b) Protection
(c) Segmentation
(d) Paging

14. Which status flag in x86 family is used to enable or disable the interrupt especially when the Pentium processor operates in the virtual mode?

(a) ID
(b) VIP
(c) VIF
(d) AC

15. Which type of non-privileged processor mode is entered due to raising of high priority of an interrupt?

(a) User mode
(b) Fast Interrupt Mode (FIQ)
(c) Interrupt Mode (IRQ)
(d) Supervisor Mode (SVC)

16. Wireless LANs implement security measures in the

(a) Session Layers
(b) Data Link Layers
(c) Sub Layers
(d) Application Layers

17. Station on a wireless ALOHA network is maximum of

(a) 400 Km
(b) 500 Km
(c) 600 Km
(d) 700 Km

18. IEEE 802.11 Direct Sequence Spread Spectrum (DSSS) uses data rate of

(a) 1 or 2 Mbps
(b) 6 to 54 Mbps
(c) 5.5 and 11 Mbps
(d) 2 and 54 Mbps

19. For Carrier Sense Multiple Access/Collision Detection (CSMA/CD), we need a restriction on the

(a) Collision Size
(b) Signal Size
(c) Frame Size
(d) Station Size

20. Transmission Control Protocol (TCP), implements an error control mechanism to provide

(a) Unreliablity
(b) Availibilty
(c) Security
(d) Reliablity

21. Bluetooth defines several protocols for upper layers that uses

(a) UDP
(b) L2CAP
(c) HSP
(d) ITP

22. To guarantee detection of up to s errors in all cases, minimum hamming distance in a block code must be

(a) s
(b) s+1
(c) s-1
(d) 0

23. Multilevel Amplitude Shift Keying (MASK) is not implemented with pure Amplitude Shift Keying (ASK), it is implemented with

(a) QAM
(b) PSK
(c) FSK
(d) Binary ASK

24. Projection of point on X axis defines peak amplitude of the

(a) above phase
(b) below phase
(c) in phase
(d) out of phase

25. Second generation of cellular phone network was developed, to provide higher-quality mobile

(a) Video Communications
(b) Signal Generation
(c) Frame Communication
(d) Voice Communications

26. Mobile Switching Center (MSC) seeks a new cell that can better accommodate communication, if strength of signals are

(a) Strong
(b) Low
(c) Diminishes
(d) High

27. Section layer is responsible for movement of a signal across a

(a) Physical Channel
(b) Physical Line
(c) Physical Section
(d) Physical Station

28. A no periodic signal has changed to a periodic signal with period equal to

(a) 2 times the bit duration
(b) 4 times the bit duration
(c) 8 times the bit duration
(d) 12 times the bit duration

29. A constellation diagram can help us to define signal's

(a) Frequency and amplitude
(b) amplitude and phase
(c) amplitude and frequency
(d) Frequency and phase

30. Paths that have an unbounded number of allowed non-minimal hops from packet sources, this situation is referred to as

(a) Unblocking
(b) Blocking
(c) Livelock
(d) Deadlock

31. Second derivative approximation says that values along ramp must be

(a) nonzero
(b) zero
(c) positive
(d) negative

32. EBCT scanners stands for

(a) electrical beam computed tomography
(b) electric beam computed tomography
(c) electronic beam computed tomography
(d) electron beam computed tomography

33. Product of one even and one odd function is

(a) even
(b) odd
(c) prime
(d) aliasing

34. First address in a block is used as network address that represents the

(a) Class Network
(b) Entity
(c) Organization
(d) Data Codes

35. In Field of User Datagram Protocol (UDP), each user datagram can travel on a

(a) Same Path
(b) Different Path
(c) Single Path
(d) Parallel Paths

EEE

Part –B (35X1=35)

1 The Energy stored in the magnetic field of a solenoid 50cm long and 5cm diameter wound with 500 turns of wire carrying a current of 5A

A 1.15 J
B 0.15J
C 0.5J
D 0.015J

2 When the plate area of a parallel plate capacitor is increased keeping the capacitor voltage constant, the force between the plates

A Increases
B Decreases
C Remain constant
D Become zero

3 What is the number of roots of the polynomial $F(z)=4z^2-8z^2-z=2$ lying outside the unit circle

A 3
B 0
C 1
D 2

4 The transfer function of a linerar time invariant system is given by
$G(S)=1/S^2+3S+2$
The steady state value of the output of this system for unit step input applied at time instant t=1 will be

A 0
B 0.5
C 1
D 2

5 No load current in transformer

A Lags the applied voltage by 90°
B Lags the applied voltage by slightly less than 90°
C Leads the applied voltage by 90°
D Leads the applied voltage by slightly less than 92°

6 The primary to secondary turns ratio of a transformer is 1:4. If the primary is connected to a 50Hz supply, the frequency of the secondary voltage in Hz is
A 25
B 50
C 100
D 75

7 Lap winding is employed for which of the following applications?
A High current and low voltage
B High current and high voltage
C Low current and low voltage
D low current and high voltage

8 Ferranti effect on long over head line is experienced, when it is
A Lightly loaded
B On full load at unity p.f
C On full load at 0.8 p.f. load
D On any load

9 The good effect of corona on overhead lines is to
A Increase the line carrying capacity due to conducting ionised air envelop around the conductor
B Increase the power factor due to corona loss
C Reduce the radio interference from the conductor
D Reduce the steepness of surge fronts

10 If Y is the per unit admittance of a system having base MVA as $(MVA)_b$ then
A $Y \propto (1/(MVA)_b)$
B $Y \propto (MVA)_b$
C $Y \propto (1/(MVA)_b^2)$
D $Y \propto (MVA)_b^2$

11 Merz price protection is a type of
A Distance protection
B Differential protection
C Both (a) and (b)
D None of the above

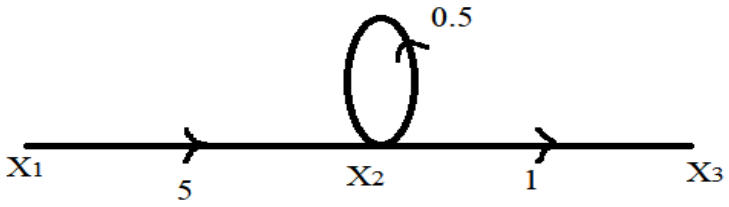
12 Which of the following is a shunt fault?
A Line to ground fault
B Line to line fault
C 3 phase fault
D All of the above

13 Air blast CB is used for
A Short duty
B Repeated duty
C Over currents
D Intermittent duty

14 STATCOM has the characteristics similar to a/an
A Induction motor
B synchronous motor
C synchronous condenser
D SVC

15 A two machine system is stable only if
A $-90^{\circ}<\delta<90^{\circ}$,dp/dδ is positive
B $\delta>90^{\circ}$,dp/dδ is negative
C $-90^{\circ}<\delta<90^{\circ}$,dp/dδ is negative
D $<\delta<90^{\circ}$,dp/dδ is positive

16 For the signal floe graph shown in fig X_3/X_1=



A 5
B 10
C 15
D 20

17 A unity feedback system has open loop transfer function
G(S)=4/
(S(S+3))
A $\omega_n=3$
B $\omega_n=2$
C Ɛ=075
D (B) and (C)

18 The system with the open loop transfer function G(s)H(s)= $1/(S^2+(S+1))$
A Type 2 and order 1
B Type 2 and order 3
C Type 2 and order 2
D Type 1 and order 3

19 The corner frequencies for the given system G(s)=1+0.1s/s(1+0.2s) are
A 5,10
B 5,15
C 15,-5
D 5,-10

20 For the given characteristics equation $s^4+3s^3+4s^2+4s+6=0$,the system is
A Stable
B Unstable
C Marginally stable
D None of these

21 The range of values of K , so that system with the following characteristics equation will be stables(s2+s+1)(s+3)+K=0
A K>3
B K>-3 and K<-2.3
C K<0
D K>-3.5

22 Maximum phase lead of 4(1+0.15s)/(1+0.05s)is
A 45degree
B 60degree
C 30degree
D 90degree

23 A system is represented by (dy/dt)+3y=4tu(t). The ramp component in the forced response will be
A $4/9te^{-3t}$
B 4/9tu(t)
C 9/3tu(t)
D 4/3tu(t)

24 Low resistance is measured by
A Schering bridge
B Maxwell's bridge
C Kelvin's double bridge
D Hay's bridge

25 Which of the following is an indicating type instrument?
A Tachometer
B CRO
C Energymeter
D ECG

26 In a junction transistor, the collector cut off current I_{CBO} reduces considerably by doping the
A Emitter with high level impurity
B Emitter with low level of impurity
C Collector with high level of impurity
D Collector with low level of impurity

27 A shift register that accept a parallel input or a bidirectional serial load is called
A Universal
B Tristate
C End around
D Conversion

28 Transistor is
A Three layer,two junction device
B Three layer, three junction device
C Two layer,two junction device
D Two layer,three junction device

29 UJT triggering is used for an SCR ,with a stand -off ratio=0.6, and dc source voltage V_{BB}=20V.The emitter voltage at which UJT triggers is
A 6V
B 12.6V
C 7.5V
D 10V

30 In a bridge rectifier the PRV rating for a diode supplying 180V dc to a resistive load is
A 90V
B 180V
C 180Πv
D 90πv

31 The converter that can operate in both 3-phase and 6-phase modes is
A 6-phase full converter
B 6-phase semi-converter
C 3-phase full converter
D 3-phase semi-converter

32 Resonant converters are basically used
A To generate large peaky voltage
B To reduce the switching losses
C To eliminate harmonics
D To convert a square wave into a sine wave

33 The frequency of ripple in the output voltage of a 3phase half controlled bridge rectifier depends on
A Firing angle
B Load inductance
C Supply frequency
D Load resistance

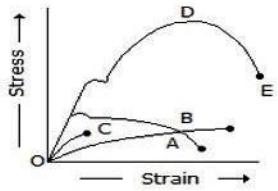
34 When a line commutated converter operates in the inverter mode
A It draws both real and reactive power from AC supply
B It delivers both real and reactive power from AC supply
C It delivers real power to AC supply
D It draws reactive power from AC supply

35 Chopper control for DC motor provides variation in
A Frequency
B Input voltage
C Both
D None of these

Mechanical Engineering

Part –B (35X1=35)

1. In the below figure, curve D represents_____.



(a) Mild steel

(b) Cast iron

(c) Concrete

(d) Rubber

2. In compression test, the fracture in cast iron specimen would occur along

a) The axis of load

b) Perpendicular to the axis of load

c) An oblique plane

d) Would not occur

3. A metallic rod of 500 mm length and 50 mm diameter, when subjected to a tensile force of 100 kN at the ends, experiences an increase in its length by 0.5 mm and a reduction in its diameter by 0.015 mm. The Poisson's ratio of the rod material ___

(a) 0.2

(b) 0.25

(c) 0.3

(d) 0.35

4. If a simple truss member carries a tensile force of T along its length, then the internal force in the member is

(a) Tensile with magnitude of T/2

(b) Tensile with magnitude of T

(c) Compressive with magnitude of T/2

(d) Compressive with magnitude of T

5. A cantilever of length (l) carries a uniformly distributed load over the whole length. The shear force diagram will be
   (a) Two equal and opposite rectangle
   (b) a rectangle
   (c) Two equal and opposite triangle
   (d) a triangle

6. In solid-state welding, the contamination layers between the surfaces to be welded are removed by
   (a) Alcohol
   (b) Plastic deformation
   (c) Water jet
   (d) Sand blasting

7. Carnot cycle efficiency depends upon
   (a) Properties of the medium/substance used
   (b) Condition of engine
   (c) Effectiveness of insulating material around the engine.
   (d) Temperature range of operation

8. The ratio of the inertia force to the viscous force is called
   (a) Reynold's number
   (b) Froude's number
   (c) Weber's number
   (d) Euler's number

9. Which of the following is not a reaction turbine?
   (a) Furneyron turbine
   (b) Kaplan turbie
   (c) Thomson's turbine
   (d) Pelton wheel

10. The specific speed of a hydraulic turbine depends upon
    (a) Speed and power developed
    (b) Speed, power developed and head of water
    (c) Speed and head of water
    (d) Discharge and power developed
11. A hydraulic ram is a device used to
    (a) Store the energy of water
    (b) Increase the pressure of water
    (c) To lift water from deep wells
    (d) To lift small quantity of water to a greater height when a large quantity of water is available at a smaller height

12. A heat engine is supplied with 800kJ/kg of heat at 600°K and heat rejection takes place at 300°K. Which of the following results report a reversible cycle?
    (a) 200kJ/sec are rejected
    (b) 400kJ/sec are rejected
    (c) 100kJ/sec are rejected
    (d) 500kJ/sec are rejected
13. The inner surface of a plane brick wall is at 60°C and the outer surface is at 35°C, Calculate the rate of heat transfer per m^2 of surface area of the wall, which is 220 mm thick. The thermal conductivity of the brick is 0.51 W/m°C.
    (a) 57.65 W/m^2
    (b) 57.75 W/m^2
    (c) 57.85 W/m^2
    (d) 57.95 W/m^2
14. In which of the following cases heat transferred by conduction, convection and radiation?
    (a) Boiler furnace
    (b) Refrigerator freezer coils
    (c) Melting of Ice
    (d) Insulated pipe carrying superheated steam

15.The process, generally used winter air conditioning to warm and humidify the air, is called

(a) humidification

(b) dehumidification

(c) heating and humidification

(d) cooling and dehumidification

16. Rotary compressors are used for delivering

(a) Small quantities of air at high pressures

(b) Large quantities of air at low pressures

(c) Small quantities of air at low pressures

(d) Large quantities of air at high pressures

17. In counter-current flow heat exchangers

(a) Both the fluids at inlet are in their hottest state

(b) Both the fluids at inlet are in their coldest state

(c) Both the fluids at exit are in their hottest state

(d) One fluid is coldest and the other is hottest at inlet

18. The relative humidity is defined as

(a) The mass of water vapour present in 1 m^3 of dry air

(b) The mass of water vapour present in 1 kg of dry air

(c) The ratio of the actual mass of water vapour in a unit mass of the dry air to the mass of water vapour in the same mass of dry air when it is saturated at the same temperature and pressure.

(d) The ratio of the actual mass of water vapour in a given volume of moist air to the mass of water vapour in the same volume of saturated air at the same temperature and pressure.

19. The difference between dry bulb temperature and dew point temperature, is called

(a) dry bulb depression
(b) wet bulb depression
(c) dewpoint depression
(d) degree of saturation

20.A device used to put off fire in the furnace of the boiler when the level of water in the boiler falls to an unsafe limit, is called

(a) blow off cock
(b) Stop valve
c) fusible plug
(b) economiser

21. Wich of the following is an example of sliding pair?

(a) piston and cylinder of a reciprocating steam engine
(b) shaft with collars at both ends fitted intoa circular hole
(c) lead screw of a lathe with nut
(d) Ball and a socket joint

22. In railway axle boxes, the bearing used is

(a) deep grove ball bearing
(b) double row self-aligning ball bearing
(c) double row spherical roller bearing
(d) cylindrical roller bearing

23. The working depth of a gear is the radial distance from the

(a) Pitch circle to the bottom of a tooth
(b) Addendum circle to the clearance circle
(c) Top of a tooth to the bottom of a tooth
(d) Pitch circle to the top of a tooth

24. Scavenging in air in diesel engine means

(a) air used for combustion sent under pressure

(b) forced air for cooling cylinder

(c) air used for forcing burnt gases out of engine's cylinder during the exhaust period

(d) burnt air containing products of combustion

25. In a typical medium speed 4-stroke cycle diesel engine the inlet valve

(a) opens at 20° before top dead center and closes at 35°after bottom dead center

(b) opens at top dead center and closes at bottom dead center

(c) opens at 10° after top dead center and closes at 20°before the bottom dead center

(d) may open or close anywhere

26. Regenerative cycle thermal efficiency

(a) is always greater than simple Rankine cycle thermal efficiency

(b) is greater than simple Rankine cycle thermal efficiency only when steam is bled at particular pressure

(c) is same as simple Rankine cycle thermal efficiency

(d) is always less than simple Rankine cycle thermal efficiency

27.For the laminar flow through a pipe, the shear stress over the cross-section

(a) varies inversely as the distance from the centre of the pipe

(b) varies directly as the distance from the surface of the pipe

(c) varies directly as the distance from the centre of the pipe

(d) remains constant over the cross-section

28. If the velocity, pressure, density, etc., do not change at any point respect to time, flow is called

(a) uniform

(b) incompressible

(c) non-uniform

(d) steady

29. The inlet length of a venturimeter

(a) is equal to the outlet length

(b) is more than the outlet length

(c) is less than the outlet length

(d) is twice the outlet length

30.The machinability of steel is improved by adding

(a) nickel

(b) chromium

(c) nickel and chromium

(d) sulphur, lead and phosphorus

31. Connecting rod is, usually, made from

(a) low carbon steel

(b) high carbon steel

(c) medium carbon steel

(d) high speed steel

32. Structural sections such as rails, angles, I-beams are made by

(a) hot rolling

(b) hot drawing

(c) hot piercing

(d) hot extrusion

33.A Jolt machine is used to

(a) ram the sand harder at the pattern face with decreasing harness towards the back of the mould

(b) ram the sand harder at the back of the mould and softer on the pattern face

(c) produce uniform sand harness throughout the mould

(d) produce uniform packing of sand in the mould

34.The cutting edge of of chisel should be

(a) Hardened

(b) Hardened and tempered

(c) Annealed

(d) Tempered

35. The lip angle of a single point tool is usually

(a) 20° to 30°

(b) 30° to 40°

(c) 40° to 60°

(d) 60° to 80°