

Duration: 120 Minutes

Total Marks: 100

(Select the most appropriate answer; Each question carries one mark. There is no negative marking)

1) A train running at the speed of 60 km/hr crosses a pole in 9 seconds. What is the length of the train?

- a) 120 meters b) 180 meters c) 324 meters d) 150 meters

2) The angle of elevation of a ladder leaning against a wall is 60° and the foot of the ladder is 4.6 m away from the wall. The length of the ladder is:

- a) 2.3 m b) 4.6 m c) 7.8 m d) 9.2 m

3) A sum of money at simple interest amounts to Rs. 815 in 3 years and to Rs. 854 in 4 years. The sum is:

- a) Rs. 650/- b) Rs. 690/- c) Rs. 698/- d) Rs. 700/-

4) Alfred buys an old scooter for Rs. 4700 and spends Rs. 800 on its repairs. If he sells the scooter for Rs. 5800, his gain percent is:

- a) 4.57% b) 5.45% c) 10% d) 12%

5) A fruit seller had some apples. He sells 40% apples and still has 420 apples. Originally, he had

- a) 588 apples b) 600 apples c) 672 apples d) 700 apples

6) Today is Monday. After 61 days, it will be

- a) Wednesday b) Saturday c) Tuesday d) Thursday

7) The average monthly income of P and Q is Rs. 5050. The average monthly income of Q and R is Rs. 6250 and the average monthly income of P and R is Rs. 5200. The monthly income of P in rupees is:

- a) 3500 b) 4000 c) 4050 d) 5000

8) Which one of the following is not a prime number?

- a) 31 b) 61 c) 71 d) 91

9) If $a - b = 3$ and $a^2 + b^2 = 29$, find the value of ab .

- a) 10 b) 12 c) 15 d) 18

10) A bag contains 2 red, 3 green and 2 blue balls. Two balls are drawn at random. What is the probability that none of the balls drawn is blue?

- a) $10/21$ b) $11/21$ c) $2/7$ d) $5/7$

11) An accurate clock shows 8 o'clock in the morning. Through how many degrees will the hour hand rotate when the clock shows 2 o'clock in the afternoon?

- a) 144° b) 150° c) 168° d) 180°

12) Find the statement that must be true according to the given information:

Sheela is twelve years old. For three years, she has been asking her parents for a dog. Her parents have told her that they believe a dog would not be happy in an apartment, but they have given her permission to have a bird. Sheela has not yet decided what kind of bird she would like to have.

- a) Sheela's parents like birds better than they like dogs
b) Sheela does not like birds.
c) Sheela and her parents live in an apartment
d) Sheela and her parents would like to move

13) Odometer is to mileage as compass is to

- a) Speed b) Hiking c) Needle d) Direction

14) Optimist is to *cheerful* as pessimist is to

- a) Gloomy b) Mean c) Petty d) Helpful

15) Statement: Unemployment allowance should be given to all unemployed Indian youth above 18 years of age.

Assumptions:

I) There are unemployed youth in India who needs monetary support.

II) The government has sufficient funds to provide allowance to all unemployed youth.

- a) Only assumption I is implicit
b) Only assumption II is implicit
c) Either I or II is implicit
d) Neither I nor II is implicit

16) Statements: All mangoes are golden in colour. No golden-coloured things are cheap.

Conclusions:

1) All mangoes are cheap.

2) Golden-coloured mangoes are not cheap.

- a) Only conclusion I follows
b) Only conclusion II follows
c) Either I or II follows
d) Neither I nor II follows

17) Look at this series: 7, 10, 8, 11, 9, 12, What number should come next?

- a) 7 b) 10 c) 12 d) 13

18) The words in the bottom row are related in the same way as the words in the top row. For each item, find the word that completes the bottom row of words.

Candle Lamp Floodlight
Hut Cottage ???

- a) Tent b) City c) Dwelling d) House

19) Apple Fruit Supermarket
Novel Book ???

- a) Vegetable b) Magazine c) Bookstore d) Shopping

20) Here are some words translated from an artificial language.

gorblflur means fan belt

pixngorbl means ceiling fan

arthtusl means tile roof

Which word could mean "ceiling tile"?

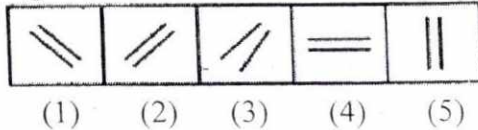
- a) gorbltusl b) flurgorbl c) arthflur d) pixnarth

21) A word is underlined followed by four answer choices. You will choose the word that is a necessary part of the underlined word

Book

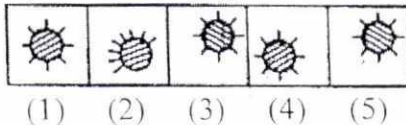
- a) Fiction b) Pages c) Pictures d) Learning

22) Choose the figure which is different from the rest.



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

23) Choose the figure which is different from the rest.



- a) 5 b) 2 c) 3 d) 1

24) Choose the alternative which closely resembles the mirror image of the given combination.

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(1) APTOTIIRAL

(2) APTOTIIRAT

(3) APTOTIIRAI

(4) APTOTIIRAT

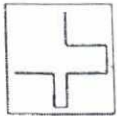
a) 1

b) 2

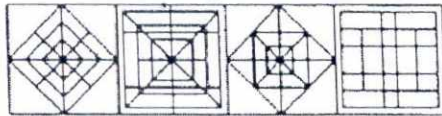
c) 3

d) 4

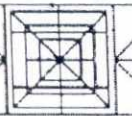
25) Find out the alternative figure which contains figure (X) as its part.



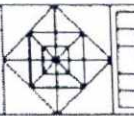
(X)



(1)



(2)



(3)



(4)

a) 1

b) 2

c) 3

d) 4

26) Identify the figure that completes the pattern



(X)



(1)



(2)



(3)



(4)

a) 1

b) 2

c) 3

d) 4

27) Find the correctly spelt word.

a) Efficient

b) Treatment

c) Beterment

d) Employd

28) Find the correctly spelt word.

a) Ommineous

b) Omineous

c) Ominous

d) Omenous

29) The study of ancient societies is known as

a) Anthropology

b) Archaeology

c) History

d) Ethnology

30) List of the business or subjects to be considered at a meeting is termed as

a) Schedule

b) Timetable

c) Agenda

d) Plan

31) Which of phrases given below each sentence should replace the phrase printed in *italics* type to make it grammatically correct?

The small child does whatever his father *was done*.

a) has done

b) did

c) does

d) had done

32) The man *to whom I sold* my house was a cheat.

- a) to whom I sell b) to who I sell c) who was sold to d) to whom I sold

33) From the given alternatives, choose the one which best expresses the given sentence in Indirect/Direct speech.

"If you don't keep quiet I shall shoot you", he said to her in a calm voice.

- a) He warned her to shoot if she didn't keep quiet calmly.
b) He said calmly that I shall shoot you if you don't be quiet.
c) He warned her calmly that he would shoot her if she didn't keep quiet.
d) Calmly he warned her that be quiet or else he will have to shoot her

34) Pick out the most effective word from the given words to fill in the blank to make the sentence meaningfully complete.

Fate smiles those who untiringly grapple with stark realities of life

- a) with b) over c) on d) round

35) If you smuggle goods into the country, they may be by the customs authority.

- a) Possessed b) Punished c) Confiscated d) Fined

36) Joule is the unit of

- a) Temperature b) Pressure c) Energy d) Heat

37) For which of the following disciplines is Nobel Prize awarded?

- a) Physics and Chemistry
b) Physiology or Medicine
c) Literature, Peace and Economics
d) All of the above

38) Professor Amartya Sen is famous in which of the fields?

- a) Biochemistry b) Electronics c) Economics d) Geology

39) What is the name of the CalTech seismologist who invented the scale used to measure the magnitude of earthquakes?

- a) Charles Richter b) Hiram Walker c) Giuseppe Mercalli d) Joshua Rumble

40) Sometimes computers are connected to a UPS system. What does UPS mean?

- a) United Parcel Service
b) Uniform Product Support
c) Under Paneling Storage
d) Uninterruptable Power Supply

- 41) A stone of mass ' m ' at the end of a string of length ' l ' is whirled in a vertical circle at a constant speed. The tension in the string will be maximum when the stone is
- At the top of the circle
 - Half-way down from the top.
 - Quarter-way down from the top.
 - at the bottom of the circle.
- 42) An integrator circuit can be used as
- Low pass filter
 - High pass filter
 - Band pass filter
 - Any of above
- 43) Properties of substances like pressure, temperature and density in thermodynamic coordinates are
- Path functions
 - Point functions
 - Cyclic functions
 - Real functions
- 44) Negative feedback in an op-amp is given to
- Decrease Bandwidth, reduce gain
 - Decrease bandwidth, increase gain
 - Increase Bandwidth, reduce gain
 - Increase Bandwidth, increase gain
- 45) When the temperature of a solid metal increases
- Strength of the metal decreases but ductility increases.
 - Both strength and ductility of the metal decrease.
 - Both strength and ductility of the metal increase.
 - Strength of the metal increased but ductility decreases.
- 46) The input impedance of the common-gate configuration of FET is
- High
 - Low
 - Medium
 - None of the these
- 47) The total area under the stress-strain curve of a steel specimen tested up to failure under tension is a measure of
- Ductility
 - Ultimate strength
 - Stiffness
 - toughness
- 48) Most common material used for a intraocular lens is
- PVC
 - Polystyrene
 - PMMA
 - Polyethylene
- 49) ISO 9000 series standards primarily deals with
- Environmental management
 - Calibration management
 - Quality management
 - Safety management

50) The natural frequency of an undamped system is 100 rad/s. A damper with a damping factor 0.8 is introduced in to the system. The frequency of vibration of damped system would be

- a) 100 rad/s b) 80 rad/s c) 60 rad/s d) 40 rad/s

51) CO₂ laser has a wavelength of

- a) 0.504 μm b) 0.530 μm c) 1.06 μm d) 10.6 μm

52) A centrifugal pump has following specifications: Speed : 1000 rpm, Flow : 1200 lpm, Head : 20m, Power : 5HP. If the speed is increased to 1500 rpm, the flow will be close to

- a) 1780 lpm b) 2480 lpm c) 1180 lpm d) 780 lpm

53) The input currents into the inverting and non inverting terminals of an operational amplifier are 520nA and 480nA respectively, what is the Input Bias current and Input offset current of the an operational amplifier?

- a) 500nA and 40nA
b) 500nA and 20nA
c) 1000nA and 40nA
d) None of the above

54) The phenomenon of cavitations in hydraulic machines is possible only at

- a) exits of pumps and turbines
b) inlets of pumps and turbines
c) exit of pump and inlet of turbine
d) exit of turbine and inlet of pump

55) In force voltage analogy, mass is equal to

- a) Capacitance b) Resistance c) Inductance d) Admittance

56) During inelastic collision of two particles, which one of the following is conserved?

- a) Total linear momentum only
b) Total kinetic energy only
c) Both linear momentum and kinetic energy
d) Neither linear momentum nor kinetic energy.

57) is an example of a thermosetting plastic

- a) Polycarbonate b) Bakelite c) Polyethylene d) Polystyrene

58) The most appropriate instrument for measuring velocity profiles is

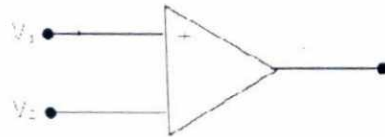
- a) Differential Manometer
b) Electromagnetic Flow Meters
c) Laser Doppler Anemometer
d) Transit time Flow Meters

59) The current coil of a 200V, 5A EDM type LPF wattmeter carries a current of $\sqrt{2} \cos(100\pi t)$ Amperes. The voltage across the pressure coil is $\sqrt{2} 200 \sin(100\pi t)$ Volts. The meter will indicate

- a) 0 Watts b) 200 Watts c) 400 Watts d) 348 Watts

- 60) The slope of the elastic portion the stress-strain curve is known as.....
 a) Toughness b) Stiffness c) Hardness d) Ductility
- 61) Reynold's number is the ratio of the inertia force to the
 a) surface tension force
 b) viscous force
 c) gravity force
 d) elastic force

62) The circuit shown can be considered as a quantizer with --- bit resolution.



- a) one b) two c) four d) eight
- 63) Which of the following is not a semiconductor ?
 a) Germanium b) Silicon c) Sapphire d) Gallium Arsenide
- 64) ISO standard specifically meant for Medical device-Quality Management System
 a) 13485 b) 15189 c) 17025 d) 9001
- 65) Hydrocephalus shunts are used for
 a) Relieving brain ventricles from excessive CSF pressure
 b) Diverting peritoneal fluid to the brain when CSF production is low
 c) Controlling the blood flow to the brain ventricles
 d) All of the above
- 66) Nominal surface area of human lung is
 a) 5 Sq.M b) 10 Sq.M c) 50 Sq.M d) 500Sq.M
- 67) Most suitable waveform for cardiac fibrillation could be
 a) 50 kHz pulsating dc waveform
 b) 2 -10 mA ac current with 75 Hz frequency
 c) dc discharge (20 – 50 Joule)
 d) Any of the above
- 68) A wire rope is designated as 6 x 19 standard hoisting. The numbers 6 x 19 represent
 a) diameter in millimeter x length in meter
 b) diameter in centimeter x length in meter
 c) Number of strands x number of wires in each strand
 d) Number of wires in each strand x number of strands

69) Number of cusps a human natural aortic valve has is...

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

70) Typical input impedance of ECG amplifier will be close to

- a) 10 m Ω b) 100 Ω c) 100 k Ω d) 10 M Ω

71) Which of the following is a neurotransmitter?

- a) Acetylcholine b) Insulin c) Thyroxin d) LHD

72) The device used for smoothing out power impulses from a reciprocating engine is called a

- a) Crank shaft b) Cam shaft c) Fly wheel d) Gear box

73) In single half wave circuit with RL load and a freewheeling diode across the load, the extinction angle β is more than π . For a firing angle α , the SCR and freewheeling diode will conduct for

- a) $\pi - \alpha, \pi - \beta$ b) $\pi - \alpha, \beta - \pi$ c) $\pi - \beta, \alpha - \beta$ d) α, β

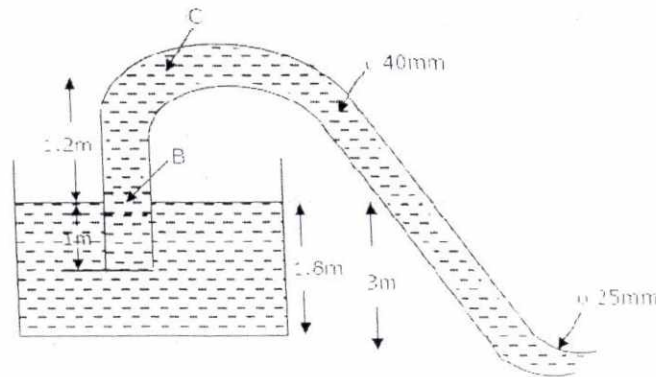
74) SI unit of shear rate is -----

- a) Newtons/Sec b) Radians/Sec c) Sec⁻¹ d) Meter/Sec

75) The elastic stress strain behavior of rubber is

- a) Linear b) non-linear c) no fixed relationship d) plastic

76) With reference to the figure, the pressure at point B would be



- a) less than atmospheric pressure
b) more than atmospheric pressure
c) atmospheric pressure
d) zero

77) Which of the statement below is not correct?

Cardiac output can be increased by.....

- a) Increasing end-systolic volume
- b) Increasing End-diastolic volume
- c) Decreasing end-systolic volume
- d) Increasing the Heart rate

78) In a 5 kW refrigerator operating on a single compression cycle, refrigerant enters evaporator with an enthalpy of 75 kJ/kg and leaves with an enthalpy of 185 kJ/kg. The enthalpy of the refrigerant after compression is 210 kJ/kg. The rate of heat transfer in the condenser will be

- a) 135 kJ/kg
- b) 285 kJ/kg
- c) 75 kJ/kg
- d) 27 kJ/kg

79) A diesel engine is usually more efficient than a spark ignition engine because

- a) Diesel being a heavier hydrocarbon, releases more heat per kg than gasoline.
- b) The air standard efficiency of diesel cycle is higher than the Otto cycle, at a fixed compression ratio.
- c) The compression ratio of a diesel engine is higher than that of an SI engine.
- d) Self ignition temperature of diesel is higher than that of gasoline.

80) Which of the following isotopes find application in cancer treatment, food preservation and sterilization of medical devices?

- a) U^{235}
- b) Po^{212}
- c) C^{14}
- d) Co^{60}

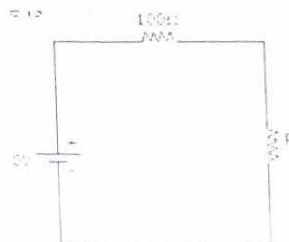
81) How many bytes of data can be transmitted per second, over an 8800 baud serial communication link using asynchronous mode of transmission and operating with one start bit, 8 data bits and two stop bits ?

- a) 800
- b) 1100
- c) 880
- d) 8000

82) What is in common between IDEAS®, ProENGINEER® and Mechanical DeskTOP® ?

- a) All of them are material safety databases
- b) All of them are computer aided design tools
- c) All of them are developed and marketed by same company
- d) All of them are web based distant learning centers

83) In the circuit shown, a $100\ \Omega$ resistance is connected in series with a 10V dc source and the load R_L . What is the maximum power that can be transferred to the load resistance R_L ?



- a) 1W
- b) 0.5 W
- c) 0.25W
- d) 0W

84) A 10 Metre height of water column will have a pressure of at its bottom

- a) 1 bar b) 300 mm of Hg c) 0.1kg/cm^2 d) 10kg/cm^2

85) Refractive index of glass is 1.5. Find the wavelength of a beam of light with a frequency of 10^{14} Hz in glass. Assume velocity of light in glass as 3×10^8 m/s.

- a) $3 \mu\text{m}$ b) $2 \mu\text{m}$ c) $1 \mu\text{m}$ d) $0.5 \mu\text{m}$

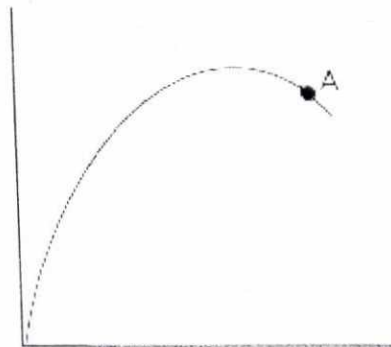
86) Absolute encoder is used for

- a) Normally one revolution
b) Continuous speed
c) Continuous speed in both direction
d) None of the above

87) Three dc voltmeters are connected across 120 V dc supply. The specifications for the three meters are Meter A – 100V, 5mA; Meter B – 100 V, $250 \Omega/\text{V}$ and meter C – 10 mA, $15 \text{k}\Omega$. The voltage indicated by the meters A, B and C respectively will be

- a) 40V, 50V, 30V
b) 50V, 45V, 25V
c) 60V, 30V, 30V
d) 30V, 50V, 40V

88) With respect to the stress strain curve given, the elastic modulus of the material is 2 GPa and the stress at the point A is 1.5 GPa. The strain at point A will be close to



- a) 0.75 b) 0.375 c) 0.15 d) None

89) A resistance potentiometer is a

- a) First order system
b) Second order system
c) Zero order system
d) None of the above

90) For a unity feedback system, the origin of the s-plane is mapped into the z-plane by the transform $z = e^{sT}$ to which one of the following?

- a) $0 + j0$ b) $1 + j0$ c) $-1 + j0$ d) $0 + j1$

91) A simple pendulum of length 5m. with a bob of mass 1 kg. is in simple harmonic motion. As it passes through its mean position, the bob has a speed of 5 m/s. The acceleration of the bob at its mean position will be

- a) 25 m/s^2 b) 0.2 m/s^2 c) 1 m/s^2 d) 0

92) Blood volume is mainly controlled by

- a) Kidney b) Vascular bed c) Lungs d) Brain

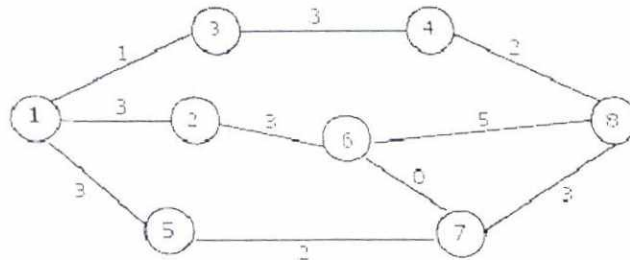
93) Which of the following is the correct sequence with respect to tensile behavior of materials?

- a) Elastic limit, Break point, Yield point
 b) Break point, Elastic limit, Yield point
 c) Yield point, Break point, Elastic limit
 d) Elastic limit, Yield point, Break point

94) When 3-2-1 principle is used to support and locate a three dimensional work-piece during machining, the number of degrees of freedom that are restricted is

- a) 7 b) 8 c) 9 d) 10

95) For the PERT chart given, the critical path is



- a) 1-3-4-8 b) 1-2-6-8 c) 1-2-6-7-8 d) 1-5-7-8

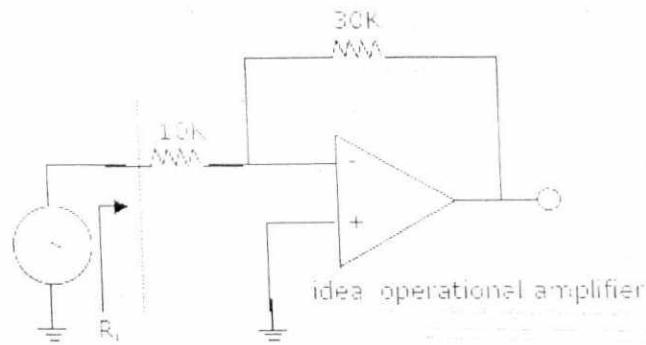
96) A fluid flow in which each liquid particle has definite path and their paths do not cross each other is called

- a) Laminar flow
 b) Turbulent flow
 c) rotational flow
 d) all of the above

97) UHMWPE is basically

- a) Polyurethane b) Polyethylene c) Polycarbonate d) Polypropylene

98) The input resistance R_i of the amplifier shown in the figure is



- a) 7.5 k b) 10 k c) 30 k d) 40 k

99) Gauge factor of a strain gauge is given by

- a) $G.F = (\Delta R/R)/\text{Strain}$
b) $G.F = (\Delta R/R) \cdot \text{Strain}$
c) $G.F = (R/\Delta R)/\text{Strain}$
d) None of the above

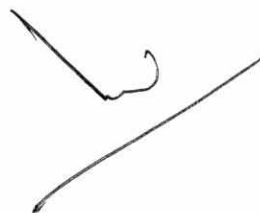
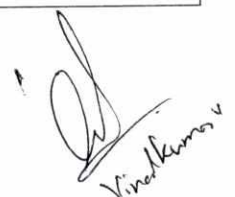
100) Which of the following statement is true ?

- a) 2 stroke engine develops half the power compared to 4 stroke engine
b) 2 stroke engine is more fuel efficient compared to 4 stroke engine
c) Mechanical efficiency of a 2 stroke engine is better than a 4 stroke engine
d) All of the above



BIOENGINEERING (41-100) STREAM

1	D	35	C	69	C
2	D	36	C	70	D
3	C	37	D	71	A
4	B	38	C	72	C
5	D	39	A	73	B
6	B	40	D	74	C
7	B	41	D	75	B
8	D	42	A	76	A
9	A	43	B	77	A
10	A	44	C	78	A
11	D	45	A	79	C
12	C	46	B	80	D
13	D	47	D	81	A
14	A	48	C	82	B
15	A	49	C	83	C
16	B	50	C	84	A
17	B	51	D	85	B
18	D	52	A	86	A
19	C	53	A	87	A
20	D	54	D	88	D
21	B	55	C	89	C
22	C	56	A	90	C
23	B	57	B	91	D
24	D	58	C	92	A
25	D	59	A	93	D
26	C	60	B	94	C
27	A	61	B	95	B
28	C	62	A	96	A
29	B	63	C	97	B
30	C	64	A	98	A
31	C	65	A	99	A
32	D	66	C	100	C
33	C	67	B		
34	C	68	C		

Vinod Kumar