

Written Examination for the Post : Electrical & Mechanical Engineering (SET 2)

ELECTRICAL ENGINEERING

1. The unit of electrical charge is
A) Coulomb B) Volt C) Joule D) Watt
2. Ohm's law can be defined as
A) $V = It$ B) $V = If$ C) $V = IR$ D) $V = I/R$
3. As per Faradays laws of electromagnetic induction, an emf is induced in a conductor whenever it
A) lies perpendicular to the magnetic flux B) lies in magnetic flux
C) cut the magnetic flux D) moves parallel to the direction of magnetic field
4. The mutual inductance between two coils, when a current changing at 20 A/s in one coil induces an e.m.f. of 10 mV in the other, is:
A) 0.5 H B) 0.5 mH C) 200 mH D) 2 H
5. The form factor is the ratio of
A) average value to rms value B) rms value to average value
C) peak value to average value D) peak value to rms value
6. A certain circuit is composed of two parallel resistors. The total resistance is 1,403 Ω . One of the resistors is 2 k Ω . The other resistor value is
A) 4.7 k Ω B) 1,403 Ω C) 2 k Ω D) 3,403 Ω
7. instruments measure the total quantity of electricity delivered at a particular time.
A) absolute B) indicating C) recording D) integrating
8. In a low power factor wattmeter the pressure coil is connected
A) To the supply side of the current coil B) To the load side of the current coil
C) In any of the two meters at connection D) To the any phase and neutral
9. In D.C. generators, lap winding is used for
A) High voltage, high current B) Low voltage, high current
C) High voltage, low current D) Low voltage, low current
10. Which part of DC motor can sustain maximum temperature rise?
A) Armature Winding B) Field winding C) Slip Ring D) Commutator
11. A no-load test on transformer is performed to determine
A) Copper losses B) No load regulation C) Iron losses D) Efficiency
12. A good regulation of transformer means
A) Output voltage fluctuations from no load to full load is minimum
B) Output voltage fluctuations from no load to full load is maximum
C) Difference between primary and secondary voltage is least
D) Difference between primary and secondary voltage is least
13. Salient poles are generally used on
A) high speed prime movers only B) medium speed prime movers only
C) low speed prime movers only D) low and medium speed prime mover

14. A synchronous motor is switched on to supply with its field windings shorted on themselves. It will

- A) not start
- B) start and continue to run as an induction motor
- C) start as an induction motor and then run as synchronous motor
- D) burn immediately

15. In three-phase squirrel-cage induction motors

- A) Rotor conductors are kept open
- B) Rotor conductors are short-circuited through end rings
- C) Rotor conductors ends are short-circuited through slip rings
- D) Rotor conductors are connected to insulation

16. The torque developed by a split phase motor is proportional to

- A) Sine of angle between I_m and I_s
- B) Cosine of angle between I_m and I_s
- C) Main winding current, I_m
- D) Auxiliary winding current I_s

17. The phenomenon of rising in voltage at the receiving end of the open-circuited or lightly loaded line is called as

- A) Roman Effect
- B) Skin Effect
- C) Corona Effect
- D) Ferranti Effect

18. For economy in generation power

- A) diversity factor should be high
- B) load factor should be high
- C) plant utilization factor should be high
- D) load factor and diversity factor should be low.

19. What is the difference between two part tariff and maximum demand tariff?

- A) A separate meter is used.
- B) A separate maximum demand meter is used.
- C) Semi fixed charges are also included.
- D) Fixed charges are also included.

20. In which portion of the transmission system is the occurrence of the fault more common?

- A) Alternators
- B) Transformers
- C) Underground cables
- D) Transmission lines

21. Arcing time is the time between

- A) Separation of circuit breaker and extinction of arc
- B) Separation of circuit breaker and rise of recovery voltage
- C) Normal current interruption and arc extinction
- D) Separation of moving contact and fixed contact

22. Generator internal fault protection is usually based the principle of

- A) Load current of alternator
- B) Cross-differential protection
- C) Differential protection
- D) Negative sequence protection

23. Transmission efficiency increases as

- A) voltage and power factor both increase
- B) voltage and power factor both decrease
- C) voltage increases but power factor decreases
- D) voltage decreases but power factor increases.

24. What are the properties of Conducting Materials with respect to temperature coefficient of resistance and tensile strength?

- A) low temperature coefficient, low tensile strength
- B) low temperature coefficient, high tensile strength
- C) high temperature coefficient, low tensile strength
- D) high temperature coefficient, high tensile strength

25. In radiation mode of heat transfer, the heat is transferred from one body to other

- A) From molecule to molecule due to the temperature gradient between two parts
- B) By actual movement of the heated molecules
- C) Without actually heating the medium in between
- D) Directly heating the medium

26. The basic elements of an electric drive are

- A) electric motor.
- B) control system.
- C) electrical motor and temperature control
- D) electrical motor and control system.

27. Electron was discovered by

- A) Chadwick
- B) Thomson
- C) Goldstein
- D) Bohr

28. An ideal voltage source 12 V provides a current of 150 mA to a load, if the load resistance is doubled the new load current becomes

- A) 75 mA
- B) 300 mA
- C) 150 mA
- D) 25 mA

29. 2. Planck's constant

- A) 6.62×10^{-34} J.min
- B) 6.62×10^{-34} Cal.sec
- C) 6.62×10^{-34} J.sec
- D) 6.62×10^{-34} Cal.min

30. The oxide-coated cathodes can be used for voltages up to

- A) 1000 V
- B) 3000 V
- C) 4000 V
- D) 10,000 V

31. In the symbols of P-N-P transistors and N-P-N transistor the arrow on the emitter shows the direction of flow of

- A) Electrons, electrons
- B) Holes, holes
- C) Holes, electrons
- D) Electrons, holes

32. The voltage gain of cascade amplifier using FET is

- A) Equal to C.D amplifier
- B) Almost equal to C.S amplifier
- C) Addition of two voltage gains
- D) Product of two voltage gains

33. A power supply has a voltage regulation of 1%. If the no-load voltage is 20 V, what is the full-load voltage?

- A) 20.8 V
- B) 15.7 V
- C) 18.6 V
- D) 17.2 V

34. What is true about the breakdown voltage in a zener diode?

- A) It decreases when load current increases.
- B) It destroys the diode.
- C) It is approximately constant.
- D) It equals current times the resistance.

35. Basic building blocks of digital multimeter are

- A) oscillator, amplifier
- B) diode, op amp
- C) rectifier, Schmitt trigger
- D) A/D, attenuator, counter

36. The sensitivity of a voltmeter which uses a 100 micro-amp meter movement is

- A) 1 k-ohm/volt
- B) 10 k-ohm/volt
- C) 5 k-ohm/volt
- D) 50 k-ohm/volt

37. How is the resistance of semiconductor classified?

- A) High resistance
- B) Positive temperature co-efficient
- C) Negative temperature co-efficient
- D) Low resistance

38. Fermi energy level for p-type extrinsic semiconductors lies

- A) Close to conduction band
- B) At middle of the band gap
- C) Close to valence band
- D) At the middle of the conduction band

39. Zener diodes can be effectively used in voltage regulator. However, they are these days being replaced by more efficient

- A) Operational Amplifier B) MOSFET C) FET D) Integrated Circuits

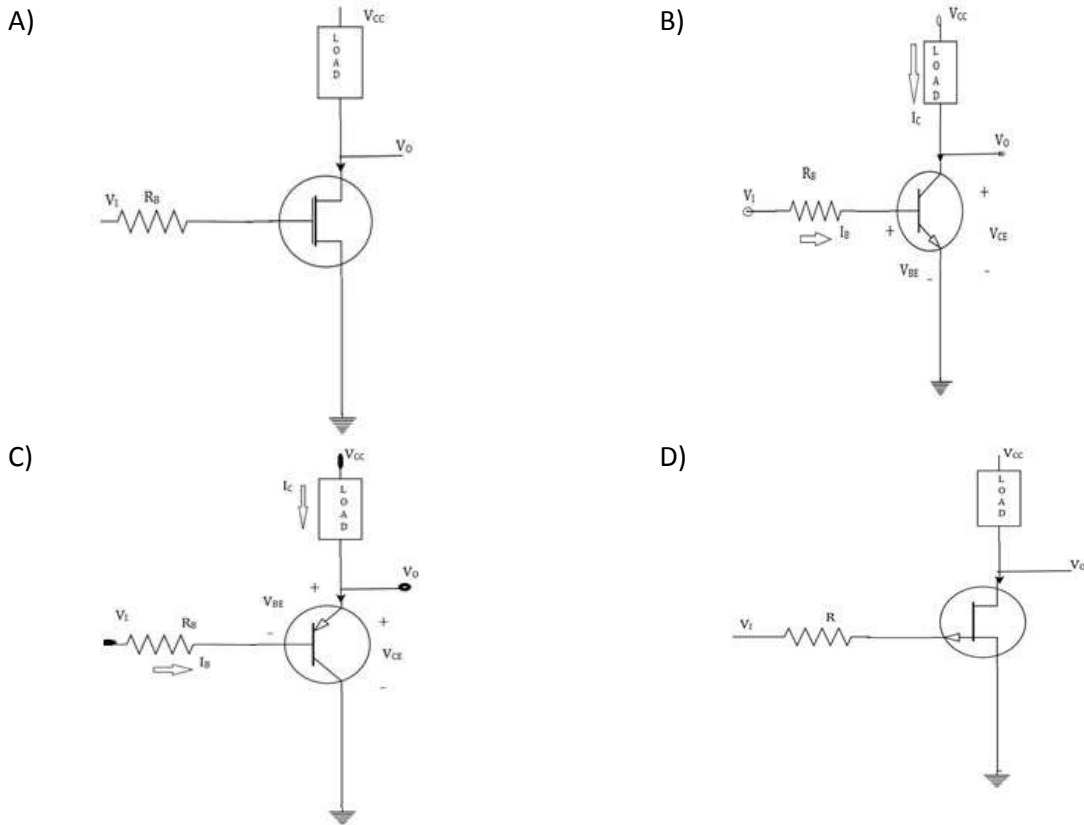
40. For a half wave or full wave rectifier the Peak Inverse Voltage of the rectifier is always

- A) Greater than the input voltage
 B) Smaller than the input voltage
 C) Equal to the input voltage
 D) Greater than the input voltage for full wave rectifier and smaller for the half wave rectifier

41. The maximum speed of electronic switch can be operations per second.

- A) 104 B) 1012 C) 109 D) 1000

42. Which of the following circuits act as a switch?



43. The operation of a JFET involves

- A) A flow of minority carriers B) Negative resistance
 C) Recombination D) A flow of majority carrier

44. In FET the drain voltage above which there is no increase in the drain current is called..... voltage

- A) Pinch off B) Critical C) Breakdown D) Pick off

45. If the gate voltage of an SCR is removed, then the

- A) anode current decreases B) anode current does not decrease at all
 C) anode current increases D) cathode current increases

46. AC power in a load can be controlled by connecting

- A) Two SCRs in series B) Two SCRs in parallel
 C) Two SCRs in parallel opposition D) Two SCRs in series opposition

47. A triac has three terminals viz.

- A) drain, source, gate
- B) two main terminal and a anode
- C) cathode, anode, gate
- D) two main terminal and a gate terminal

48. Which of the following is the drawback of Triac

- A) It doesn't appropriate for the DC power.
- B) In the TRIACs, there will be single gate control conduction in both the directions.
- C) If the voltage is decreased to zero the TRIAC turns OFF.
- D) Basically, it is bidirectional device and in the both the directions it will conduct.

49. The UJT may be used as

- A) an amplifier
- B) a sawtooth generator
- C) a rectifier
- D) a switch

50. For an UJT to function, the load line must extend

- A) from saturation region to ohmic region.
- B) from saturation to peak value of emitter voltage.
- C) from valley point to peak point.
- D) within valley and peak points in the negative resistance region.

MECHANICAL ENGINEERING

51. The power from the sun intercepted by the earth is approximately
A) 1.8×10^8 MW B) 1.8×10^{11} MW C) 1.8×10^{14} MW D) 1.8×10^{17} MW
52. Which of the following type of collector is used for low temperature systems?
A) Flat plate collector B) Line focusing parabolic collector
C) Paraboloid dish collector D) All of the above
53. For obtaining high COP, the pressure range of compressor should be
A) High B) Low C) Optimum D) Any value
54. The condition of refrigerant after passing through the condenser in a vapour compression system is
A) Saturated liquid B) Wet vapour C) Dry saturated vapour D) Superheated vapour
55. The relative coefficient of performance (C.O.P.) is equal to.....
A) Theoretical C.O.P./Actual C.O.P. B) Actual C.O.P./Theoretical C.O.P.
C) Theoretical C.O.P. x Actual C.O.P. D) None of the above
56. Moisture in a refrigerant system is removed by.....
A) Driers B) Filter-driers C) Dessicants D) All of the above
57. Most of the domestic refrigerators work on the following refrigeration system
A) vapour compression B) vapour absorption
C) carnot cycle D) electrolux refrigerator
58. Moisture in freon refrigeration system causes
A) ineffective refrigeration B) high power consumption
C) freezing automatic regulating valve D) corrosion of whole system
59. The ratio of specific weight of a liquid to the specific weight of pure water at a standard temperature is called
A) density of liquid B) specific gravity of liquid
C) compressibility of liquid D) surface tension of liquid
60. When a body is immersed wholly or partially in a liquid, it is lifted up by a force equal to the weight of liquid displaced by the body. This statement is called
A) Pascal's law B) Archimede's principle
C) principle of floatation D) Bernoulli's theorem
61. The patterns which are made in two or more pieces are called as
A) solid patters B) split patterns C) loose piece patterns D) none of the above
62. Which of the following is an example of constant mass manufacturing process?
A) Rolling B) Turning C) Broaching D) Sawing
63. Which of the following is not a part of the chassis?
A) Wheels B) Front axle C) Steering system D) Seats
64. Wheel base of a vehicle is the
A) Distance between the centres of the front and rear wheels
B) Distance between the centres of the front tyres
C) Distance between the centres of the rear tyres
D) Extreme length of the vehicle

65. The clutch is located between the transmission and the
A) Engine B) Rear axle C) Propeller shaft D) Differential
66. In a ventilated disc brake
A) A duct directs air towards the caliper for cooling while the vehicle is moving.
B) Caliper is covered with cooling fins.
C) Disc contains many small holes for optimum cooling performance.
D) Disc contains radial vanes between its rubbing surfaces for optimum cooling performance.
67. The compression ratio in petrol engine is kept less than in Diesel engine because
A) It makes petrol engines lighter.
B) Higher or equivalent compression ratio in petrol engines is not possible due to pre-ignition.
C) Less compression ratio gives better performance.
D) It is just customary to have less compression ratio in petrol engines.
68. When the piston is at T.D.C., the volume above the piston in the combustion chamber is the
A) Clearance volume B) Cylinder volume C) Exhaust volume D) None of these
69. The forced fed lubrication system means that the oil is delivered to the engine by
A) Gravity B) The pressure created by the oil pump
C) Splashing action of the crankshaft D) None of these
70. The viscosity is measured by
A) Barometer B) Thermometer C) Viscosimeter D) None of the mentioned
71. The control of cooling system in air-cooled system is not easier than in water-cooled system.
A) True B) False
72. If the speed of the engine is increased, the indicated power will
A) Increase B) Decrease C) Remain same D) None of the mentioned
73. Which of the following is the lightest and most volatile liquid fuel?
A) Diesel B) Petrol C) Gasoline D) Fuel oil
74. Both Stirling and Carnot cycles operate within the same temperature limits, then efficiency of Stirling cycle as compared to Carnot cycle is
A) More B) Less C) Equal D) None of the mentioned
75. If petrol is used in a diesel engine, then
A) low power will be produced B) efficiency will be low
C) higher knocking will occur D) black smoke will be produced
76. The region of safety in maximum shear stress theory contains which of the given shape
A) Hexagon B) Rectangle C) Square D) None of the mentioned
77. Which of the following parameters can be obtained by tension test of a standard specimen?
A) Proportional Limit B) Yield Strength
C) Percentage Reduction in area D) All of the mentioned
78. Which of the following are true for toughness
A) Ability of material to absorb energy before fracture B) Measured by Izod & Charpy test
C) Decreases with the increase in temperature D) All of the mentioned

79. The phenomenon of decreased resistance of the materials to fluctuating stresses is the main characteristic of _____ failure.

- A) Fracture B) Fatigue C) Yielding D) None of the mentioned

80. In which of the following case stress concentration factor is ignored?

- A) Ductile material under static load B) Ductile material under fluctuating load
C) Brittle material under static load D) Brittle material under fluctuating load

81. For components made of ductile materials like steel, subjected to static loading which of the following strength is used as a failure of criterion?

- A) Yield strength B) Ultimate strength C) Endurance limit D) None of the mentioned

82. Pneumatic and other power systems can support three kinds of motion; they are

- A) Linear, reciprocating, and random motion B) Linear, flowing, and rotary motion
C) Linear, zigzag, and spiral motion D) Linear, reciprocating, and rotary motion

83. Which of the following is responsible for quality objective?

- A) Top level management B) Middle level management
C) Frontline management D) All of the above

84. _____ helps organization reduce employee turnover and absenteeism.

- A) Job design B) Training & development C) Wage revision D) All of the above

85. Finance must keep investment and costs low. This can be done by _____

- A) Increasing inventory so inventory investment is at a maximum
B) Decreasing the number of plants and warehouses
C) Producing small quantities
D) Using short production runs

86. Materials management is also called _____

- A) Distribution planning B) Control and logistics management
C) Both of the above D) Neither of the above

87. The multi stage compression as compared to single stage compression.....

- A) Improves volumetric efficiency for the given pressure ratio B) Reduces work done per kg of air
C) Reduces cost of compressor D) All of the above

88. Euler's equation is applicable for.....

- A) Centrifugal compressor B) Axial compressor C) Pumps D) All of the above

89. Which type of chemical reaction is observed at cathode, in electrochemical corrosion?

- A) Oxidation reaction B) Peritectic reaction
C) Reduction reaction D) None of the above

90. The intergranular corrosion can be prevented using _____

- A) stabilized grade of stainless steel containing titanium and niobium as an alloying element
B) low carbon grade of stainless steel
C) both (A) and (B).
D) none of the above

91. The protective coatings are used to _____

- A) Corrode the metal B) Prevent from corrosion
C) Increase the corrosion D) Slightly increase the corrosion

92. The process of coating iron or steel sheet with a thin coat of zinc to prevent iron from rusting is called _____

- A) Tinning B) Galvanization C) Metal cladding D) Electroplating

93. Check list for Job Safety Analysis (JSA) consists of

- A) Work area, material, machine, tools B) Men, machine, material, tools
C) Men, machine, work area, tools D) Men, work area. Material, tools

94. A safety programme consists of

- A) Three E's B) Four E's C) Five E's D) Six E's

95. If a number of forces act simultaneously on a particle, it is possible

- A) not to replace them by a single force B) to replace them by a single force
C) to replace them by a single force through C.G. D) to replace them by a couple

96. A force is completely defined when we specify

- A) magnitude B) direction C) point of application D) all of the above

97. The net force of the body is zero that means the force are not being applied to the body at all and hence the body is in equilibrium.

- A) The first part of the statement is false and other part is true.
B) The first part of the statement is false and other part is false too.
C) The first part of the statement is true and other part is false.
D) The first part of the statement is true and other part is true too.

98. Deformation per unit length in the direction of force is known as

- A) strain B) lateral strain C) linear strain D) linear stress

99. Which of the following has no unit

- A) kinematic viscosity B) surface tension C) bulk modulus D) strain

100. The property of a material which allows it to be drawn into a smaller section is called

- A) plasticity B) ductility C) elasticity D) malleability

Electrical & Mechanical Engineering - Ans Key – SET- 2

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