MODEL PAPER OF LATERAL ENTRY ENTRANCE EXAMINATION - MECHANICAL ENGINEERING

I – PHYSICS

1. The frictional force between two surfaces is independent of:
   a) Nature of surface b) area of contactc) mass of body d) None of these
2. The displacement of an particle along a straight line at time t is given by $X = a_0 - a_1 t + a_2 t^2$
   The acceleration is equal to:
   a) a_0 b) a_1 c) $2a_2$ d) None of these.
3. If the relation between distance and time is $S = a + bt + ct^2$. Then initial velocity is:
   a) b+2c b) b c) 2c d) None of these
4. Acceleration is a:
   a) Vector quantity b) Scalar quantity c) Neither vector nor scalar d) None of these
5. The correct expression for power (P) in terms of work and time is
   a) Work/time b) work× time c) work + time d) None of these.
6. The S.I unit of power is :
   a) J/s b) J s c) J s^2 d) None of these
7. For a freely falling body, the sum of kinetic energy and potential energy
   a) Always remains same b) Always increases c) Decreases d) None of these
8. A light and heavy body have equal momentum which one has greater kinetic energy:
   a) The heavy body b) the light body c) Bothe have equal momentum d) the data is incomplete.
9. A force of $f = 5\hat{i} + 3\hat{j} + 4\hat{k}$ makes displacement $S = 6\hat{i} - 5\hat{k}$ work done by force is:
   a) 30 units b) 10 units c)25 units d) None of these
10. The unit of velocity is:
    a) m/s b) m/s^2 c) ms d) None of these
11. One electron of volt of energy is equal to:
    a) 1.6×10^{-15} J b) 1.6×10^{-19} J c) 1.6×10^{-20} J d) None of these
12. One angstrom is equal to:
    a) 10^{-12} m b) 10^{-10} m c) 10^{-9} m d) None of these
13. A particle starts from rest travels a distance of 4 m in 2 seconds. What will be the speed of this particle
    a. 2 m/s b. 8 m/s c. ½ m/s d. None of these
14. One km/hr of speed is equal to:
    a. 5/18 m s^{-1} b 18/5 m s^{-1} c. 18 m s^{-1} d. None these
15. A particle moves with a speed of 10 m/s. The distance covered in 9 seconds will be:
    a. 10/9 m b. 90 m c. 9/10 m d. None of these

II – CHEMISTRY

16 A balanced chemical equation always obeys:
(a) Law of conservation of mass
(b) Law of thermal equilibrium
(c) Law of conservation of energy
(d) All of the above

17 Single displacement reaction involves:
(a) Oxidation
(b) Reduction
(c) Redox
(d) Heating

18 String of ants, bees contain"
(a) Formic acid
(b) Vinegar
(c) Succinic acid
(d) Common Salt (NaCl)

19 In the reaction, $2FeCl_2 + Cl_2 \rightarrow 2FeCl_3$, chlorine may be regarded as:
(a) an oxidizing agent
(b) a reducing agent
(c) a catalyst
(d) providing an inert medium

20 The conversion of $K_2Cr_2O_7$ into $Cr_2(SO_4)_3$ is a process of:
(a) Oxidation
(b) Reduction
(c) Decomposition
(d) Substitution

21 Major constituent of LPG is _____.
(a) ethene
(b) butane
(c) propane
(d) pentane

22 The gas used in welding and cutting metals is:
(a) ethyne
(b) ethene
(c) ethane
(d) propene

23 Which one of the following is an unsaturated hydrocarbon?
(a) Acetylene
(b) Butane
(c) Propane
(d) Decane

24 Which of the following is NOT True for metals?
(a) Generally metals are malleable.
(b) Metals are good conductors of heat.
(c) Metals are electronegative by nature.
(d) Metals displace hydrogen gas from dilute acids.

25 In general the number of electrons in the outermost shell of a metal atom is:
(a) 1
(b) 1 to 3
(c) 5 to 8

(d) 8

26 Bauxite is an ore of which metal:
(a) iron
(b) aluminium
(c) copper
(d) tin

27 Which of the following pairs will give displacement reactions?
(a) NaCl solution and copper metal
(b) $MgCl_2$ solution and aluminium metal
(c) $FeSO_4$ solution and silver metal
(d) $AgNO_3$ solution and copper metal.

28 Which of the following methods is suitable for preventing an iron frying pan from rusting?
(a) Applying grease
(b) Applying paint
(c) Applying a coating of zinc
(d) All of the above.

29 An element reacts with oxygen to give a compound with a high melting point. This compound is also soluble in water. The element is likely to be:
(a) calcium
(b) carbon
(c) silicon
(d) iron.

30 Food cans are coated with tin and not with zinc because:
(a) zinc is costlier than tin.
(b) zinc has a higher melting point than tin.
(c) zinc is more reactive than tin.
(d) zinc is less reactive than tin.

III – MATHEMATICS

31 Find the value of m so that the equation $4x^2 - 8mx - 9 = 0$ has one root as the negative of the other
1) 0 2) 1 3) -1 4) none of these

32 Construct a quadratic equation whose roots are 3 and -3
1) $x^2 + 9 = 0$ 2) $x^2 - 9 = 0$ 3) $x^2 + 9x + 3 = 0$ 4) $x^2 - 9x - 3 = 0$

33 Find the zeros of the quadratic polynomial $x^2 + 7x + 12 = 0$
1)-2,-5 2) -3,-4 3) 2,5 4) 3,4

34 Find two consecutive positive even integers whose squares have the sum 340
1)8,10 2) 14,16 3) 10,12 4) 12,14

35 If p, q are the zeros of the polynomial $x^2 - 5x - k$ such that $p - q = 1$, then the value of k is
1)6 2) 7 3) 8 4) 9

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36 If $Tan\theta = Cot\lambda$ then $\theta + \lambda =$

1) $\frac{\pi}{2}$ 2) $\frac{\pi}{4}$ 3) $\frac{\pi}{6}$ 4) 0

37 If $Sec\theta = \frac{13}{12}$, then $Co\sec\theta$ is equal to

1) $\frac{13}{5}$ 2) $\frac{5}{13}$ 3) $\frac{12}{5}$ 4) $\frac{5}{12}$

38 From the top of a cliff, the angle of depression of a place 150meters away from the foot of the cliff is 45^0 .The height of the cliff is
250m 2) 200m 3) 300m 4) 150m

39 $Sin(\pi + \theta)$ is equal to

1) $Sin\theta$ 2) $-Sin\theta$ 3) $Cos\theta$ 4) $-Cos\theta$

40 If $Sec\phi = Co\sec(\phi - 20^0)$.Then value of ϕ is
1)25^0 2)22^0 3)45^0 4) 90^0

41 The surface area of a sphere is 324 π cm^2.Find its volume.

1) 324 π cm^3 2) 648 π cm^3 3) 972 π cm^3 4) 1296 π cm^3

42 Two right circular cones of dimensions h=4.1cm ,r=2.1cm & h=4.3cm , r=2.1cm. are melted to form a sphere of radius
1)2.1cm 2) 2.5cm 3) 3.5 cm 4) 4.2cm

43 Surface area of Hemisphere is

1) $4\pi r^2$ 2) $2\pi r^2$ 3) $4\pi r^3$ 4) $2\pi r^3$

44 The radii of two cylinders are in the ratio 2:5 and their heights 5:2. The ratio of their volumes is
1) 1:1 2) 2:5 3) 5:2 4) 2:3

45 If the volume of the cube is $216m^3$,then find its Total surface area

1)$212m^2$ 2) $214m^2$ 3) $216m^2$ 4) $220m^2$

IV – TECHNICAL

Q46: The theoretical correct mixture of air and petrol is :
(a) 10 : 1
(b) 15 : 1
(c) 20: 1
(d) 25 : 1

Q47: Thermal efficiency of a two stroke cycle engine is ..... a four stroke cycle engine
(a) equal to
(b) greater than
(c) less than
(d) none of these

Q48: A diesel engine during suction stroke, draws
(a) air only
(b) diesel only
(c) both of these
(d) none of these

Q49: A petrol engine has compression ratio of
(a) 6 to 10
(b) 10-15
(c) 15-20
(d) 20-30

Q50: The voltage required to produce a spark across the gap, between sparking points is:
(a) 2000 to 4000 volts
(b) 4000 to 6000 volts
(c) 6000 to 10,000 volts
(d) 10,000 to 12,000 volts

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Q51: The function of distributor in a coil ignition system of IC engine is
(a) to distribute spark
(b) to distribute power
(c) to distribute current
(d) to time the spark

Q52: The air-fuel ratio in petrol engine is controlled by
(a) carburettor
(b) injector
(c) governor
(d) none of these

Q53: The Knocking in diesel engines may be decreased by
(a) reducing the delay period
(b) raising the compression ratio
(c) increasing the inlet pressure of air
(d) all of these

Q54: The octane number of petrol generally available is
(a) 20 to 40
(b) 40 to 60
(c) 60 to 80
(d) 80 to 100

Q55: The thermal efficiency of diesel engine is about
(a) 15%
(b) 30%
(c) 50%
(d) 70%

Q56: Morse test can be conducted for
(a) petrol engines
(b) diesel engines
(c) multi cylinder engines
(d) all of these

Q57: The ratio of break power to indicated power is called
(a) mechanical efficiency
(b) overall efficiency
(c) indicated thermal efficiency
(d) volumetric efficiency

Q58: The indicated power for multi cylinder engine will be same for single cylinder engine
(a) agree
(b) disagree

Q59: The spark plus gap is kept from
(a) 0.3 to 0.7mm
(b) 0.2 to 0.8mm
(c) 0.4 to 0.9mm
(d) 0.6 to 1.0mm

Q60: Supercharging ..... the power developed by the engine
(a) has no effect on
(b) increases
(c) decreases
(d) fluctuates

Q61: The coefficient of performance is always..... one
(a) equal to
(b) greater than
(c) less than
(d) none of these

Q62: The C.O.P of a Carnot refrigerator in winter will be..... as compared to C.O.P in summer
(a) same
(b) lower
(c) higher

(d) none of these

Q63: Air refrigerator works on

(a) reversed carnot cycle
(b) reversed otto cycle
(c) reversed joule cycle
(d) reversed rankine cycle

Q64: In a refrigerating machine, heat rejected is..... heat absorbed

(a) equal to
(b) less than
(c) greater than
(d) none of these

Q65: In a vapour compression cycle, the condition of refrigerant before entering the condenser is

(a) saturated liquid
(b) wet vapour
(c) dry saturated vapour
(d) superheated vapour

Q66: The lowest temperature during the vapour compression cycle occurs after

(a) compression
(b) expansion
(c) condensation
(d) evaporation

Q67: The sub cooling of a refrigeration cycle

(a) does not alter C.O.P
(b) increases C.O.P
(c) decreases C.O.P
(d) none of these

Q68: During condensation of refrigerant, ... heat is released

(a) latent
(b) sensible
(c) total
(d) work

Q69: Which of the following refrigerants is highly toxic and flammable

(a) Ammonia
(b) Carbon dioxide
(c) Sulphur dioxide
(d) Water

Q70: Which of the following refrigerant has the maximum ozone depletion potential

(a) Ammonia
(b) Carbon dioxide
(c) Sulphur dioxide
(d) Fluorine

Q71: A condenser is used in ..... pressure side of refrigerator

(a) low
(b) high
(c) medium
(d) zero

Q72: The natural convection air cooled condensers are used in

(a) domestic refrigerators
(b) water coolers
(c) room air conditioners
(d) all of these

Q73: The capillary tube as an expansion device is used in

(a) domestic refrigerators
(b) water coolers
(c) room air conditioners

(d) all of these

Q74: The refrigerant widely used in domestic refrigerator is

(a) Ammonia
(b) CO_2
(c) SO_2
(d)R-12

Q75: The condition of refrigerant after passing through the compressor is

(a) saturated vapour
(b) superheated vapour
(c) saturated liquid
(d) superheated liquid

Q76: Which of the following materials can be used for making patterns

(a) Aluminium
(b) wax
(c) Lead
(d) All of these

Q77: A moving mandrel is used in

(a) wire drawing
(b) tube drawing
(c) metal cutting
(d) forging

Q78: When a pattern is made in three parts, the top part is known as

(a) drag
(b) cheek
(c) cope
(d) none of these

Q79: The property of sand due to which it evolves great amount of steam and other gases is

(a) collapsibility
(b) permeability
(c) cohesiveness
(d) adhesiveness

Q80: The sand used for making cores is

(a) green sand
(b) dry sand
(c) loam sand
(d) oil sand

Q81: cast iron and steel pipes are produced by

(a) slush casting
(b) investment casting
(c) centrifugal casting
(d) die casting

Q82: In arc welding, the electric arc is produced between the work and electrode by

(a) voltage
(b) flow of current
(c) contact resistance
(d) all of these

Q83: Which of the following welding method uses a pool of molten metal

(a) carbon arc welding
(b) submerged arc welding
(c) TIG welding
(d) MIG welding

Q84: Which of the following welding process uses a non consumable electrode

(a) TIG welding
(b) MIG welding

(c) Manual arc welding
(d) Submerged arc welding

Q85: Neutral flame is used to weld
(a) steel
(b) cast iron
(c) copper
(d) all of these

Q86: For arc welding,
(a) alternating current with high frequency is used
(b) alternating current with low frequency is used
(c) direct current is used
(d) no current is used

Q87: The commonly used gas in Gas welding is
(a) methane
(b) acetylene
(c) CO_2
(d) Neon

Q88: The welding process in which a mixture of aluminium and iron oxide are used is
(a) arc welding
(b) gas welding
(c) thermit welding
(d) seam welding

Q89: Disc electrodes are used in
(a) seam welding
(b) spot welding
(c) projection welding
(d) TIG welding

Q90: Wax patterns are used in
(a) slush casting
(b) investment casting
(c) die casting
(d) risers

Q91: Thin continuous lines uniformly spaced usually at 45^o to show a part in section are
(a) construction lines
(b) section lines
(c) hidden lines
(d) section lines

Q92: Hidden objects are shown by
(a) solid lines
(b) dotted lines
(c) section lines
(d) leader lines

Q93: In first angle projection drawing, side view is drawn
(a) above reference line
(b) below reference line
(c) on the reference line
(d) none of these

Q94: Isometric view is drawn at an angle of
(a) 45^o
(b) 30^o
(c) 65^o
(d) 80^o

Q95: Rough surfaces are shown by

(a) break lines
(b) dotted lines
(c) solid lines
(d) leader lines

Q96: Title box is drawn on which side of the drawing sheet

(a) bottom right
(b) bottom left
(c) top right
(d) top left

Q97: Dimension lines are..... than figure lines

(a) darker
(b) lighter
(c) thicker
(d) thinner

Q98: Both the front view and top view of an object lie above reference line when drawn in

(a) first quadrant
(b) second quadrant
(c) third quadrant
(d) fourth quadrant

Q99: In third angle projections, top view lies

(a) above H.P
(b) below H.P
(c) above V.P
(d) below V.P

Q100: The line with arrow heads on its ends is known as

(a) projection line
(b) dimension line
(c) figure line
(d) hidden line