



BSF Head Constable (RM) 22 September 2019

1. The torque in induction watt meters is due to
(a) capacitive current (b) electrostatic effect
(c) hall effect (d) eddy currents
2. Two resistances are: $R_1 = 36 \Omega \pm 1.89 \Omega$ and $R_2 = 75 \Omega \pm 3.75 \Omega$. The sum $R_1 + R_2$ along with limiting error is
(a) $111 \Omega \pm 1.8 \Omega$ (b) $111 \Omega \pm 3.75 \Omega$
(c) $111 \Omega \pm 5.55 \Omega$ (d) $111 \Omega \pm 1.95 \Omega$
3. The resistance in the circuit of the moving coil of a dynamometer wattmeter should be
(a) very low (b) low
(c) high (d) almost zero
4. The current measured by an ammeter connected in an a.c. circuit is 20 A, the value of maximum current is
(a) $10\sqrt{2} A$ (b) $10/\sqrt{2} A$
(c) $20\sqrt{2} A$ (d) $20 \times 1.11 A$
5. Thermocouple meter can be used to measure
(a) d.c. only (b) a.c. only
(c) Both a.c. and d.c (d) None of these
6. Angle between the viscous force and the direction of flow of the liquid is:
(a) $\pi/2$ (b) $\pi/4$
(c) π (d) zero
7. Clouds float in the air, because of:
(a) low viscosity (b) high viscosity
(c) low density (d) high density
8. Which of the following is not thermodynamical function:
(a) Enthalpy (b) Work done
(c) Gibb's energy (d) Internal energy
9. In which process, the rate of transfer of heat is maximum:
(a) conduction
(b) convection
(c) Radiation
(d) In all, heat is transferred with the same speed.
10. A cycle tire bursts suddenly. This represents an:
(a) Isothermal process (b) Isobaric process
(c) Isochoric process (d) Adiabatic process
11. A sample of gas is at 0°C . To what temperature must it be raised in order to double the r.m.s speed of molecules:
(a) 273°C (b) 1092°C
(c) 819°C (d) 100°C
12. What will be the magnification when the object is placed at $2f$ from the pole of convex mirror
(a) $-1/3$ (b) $+2/3$
(c) $+1$ (d) $3/2$
13. A well cut diamond appears bright because:
(a) it emit light
(b) of large density
(c) of total internal reflection
(d) it is crystal
14. The focal length of convex lens is 50cm what is its power
(a) + 50D (b) -50D
(c) -2D (d) +2D
15. Which of following properties of the sound waves are affected by changing temperature
(a) Wave length (b) Frequency
(c) Amplitude (d) Intensity
16. One decibel is equal to
(a) $\frac{1}{10}$ bel (b) 10 bel
(c) $\frac{9}{10}$ bel (d) $\frac{1}{9}$ bel
17. The frequency of S.H.M is 100Hz. Its time period is
(a) 100 sec (b) 1 sec
(c) 0.1 sec (d) 0.01 sec
18. An echo is heard due to the
(a) reflection of sound waves
(b) reflection of sound waves
(c) interference of sound waves
(d) resonance
19. Radio carbon dating technique is used to estimate the age of
(a) rocks (b) soil
(c) fossils (d) buildings
20. Enriched uranium means uranium that has been enriched in isotope
(a) uranium-233 (b) uranium-235
(c) uranium-238 (d) uranium-239
21. The Young's modulus of a rod of length L and radius R is Y . The rod is cut into two parts of equal length $L/2$, then Young's modulus of each part will be
(a) Y (b) $Y/2$
(c) $Y/4$ (d) $4Y$



22. The Poission ratio of a material is 0.5. If the longitudinal stress in its uniform rod is 2×10^{-3} , the percentage change in its volume is
 (a) 0.6 (b) 0.4
 (c) 0.2 (d) Zero
23. A man of 25 Kg weight climbs 25 stairs in 20 seconds. If the height of each stair is 40 cm, find the power. ($g = 10\text{m/s}^2$)
 (a) 125 watt (b) 25 watt
 (c) 5 watt (d) 100 watt
24. If a machine works with the rate of 10 Joule/s then its power will be
 (a) 10 watt (b) 20 watt
 (c) 60 watt (d) 1 watt
25. A ball falls from a height of 20 m, and then bounces back up to 10m height. The loss of energy is
 (a) 5% (b) 25%
 (c) 50% (d) 75%
26. The first law of thermodynamics is based on the law of conservation of
 (a) energy (b) mass
 (c) momentum (d) None of these
27. For 100% efficiency of a Carnot engine the temperature of the source should be
 (a) -273°C (b) 0°C
 (c) 273°C (d) Infinite
28. Which of the following state of the matter have two specific heats?
 (a) solid (b) gas
 (c) liquid (d) None of these
29. In international standard system the unit of frequency is
 (a) cm/sec (b) number of cycles/min
 (c) Hertz (d) meter/sec²
30. The kinetic energy possessed by the body is due to its
 (a) position (b) motion
 (c) reaction (d) None of these
31. A capacitor (condenser) is used in an electrical circuit to
 (a) step down voltage (b) step up voltage
 (c) store electric charge (d) produce electric charge
32. Which of the following does not rely on the magnetic effect of current for its working
 (a) fan (b) telephone receiver
 (c) carbon microphone (d) dynamo
33. Which of the following devices covert electrical energy into mechanical energy?
 (a) dynamo (b) transformer
 (c) electric motor (d) inductor
34. A transformer is a device for
 (a) stepping up (or down) dc voltage
 (b) generating electricity
 (c) stepping up (or down) ac voltage
 (d) converting ac into dc
35. 12 V battery has how many plates
 (a) 15, 17, 19, 27 (b) 27, 28, 29, 30
 (c) 7, 9, 11, 17 (d) 30, 31, 32, 33
36. In an AC circuit, SCR works like a
 (a) transistor (b) alternator
 (c) full wave rectifier (d) half wave rectifier
37. The Resonance circuits are used in
 (a) rectifiers (b) amplifiers
 (c) oscillators (d) both amplifiers and oscillators
38. The dimensions of EMF are
 (a) $\text{ML}^2\text{I}^{-1}\text{T}^{-3}$ (b) $\text{ML}^2\text{I}^{-2}\text{T}^{-3}$
 (c) $\text{M}^{-1}\text{T}^{-3}$ (d) $\text{ML}^3\text{I}^{-1}\text{T}^{-3}$
39. Magnetic field intensity has the dimensions
 (a) IL (b) I^2L
 (c) IL^{-1} (d) IL^{-2}
40. The current in a circuit is measured using a 150 : 1 CT If the ammeter reads 0.6 A, the circuit current is
 (a) 250 A (b) 90 A
 (c) 156 A (d) 144 A
41. If $n(A) = 20$, $n(B) = 35$ and $n(A \cup B) = 45$, then $n(A \cap B)$ equals
 (a) 10 (b) 15
 (c) 0 (d) None of these
42. Value of $\left(\frac{x^4}{x^3}\right)^{3/4}$ is
 (a) x (b) $x^{25/12}$
 (c) x^0 (d) $x^{3/4}$
43. The roots of the equations $x^2 + 2x - 35 = 0$ are
 (a) -5 and -7 (b) 5 and 7
 (c) -5 and 7 (d) 5 and -7
44. At the centre of a circle of 10 cm radius, the angle made by an arc of $12\frac{2}{9}$ cm length is
 (a) 60° (b) 65°
 (c) 70° (d) 75°



45. In which of the following cases, a triangle can not be formed with the given length of side?
 (a) 4, 5, 6 (b) 5, 8, 12
 (c) 10, 12, 15 (d) 5, 9, 17
46. The square root of $(3 + 2\sqrt{2})$ is
 (a) $(\sqrt{3} + \sqrt{8})$ (b) $(\sqrt{3} + \sqrt{2})$
 (c) $(1 + \sqrt{2})$ (d) $(\sqrt{2} + \sqrt{6})$
47. A clock rings 12 times in 33 seconds, then in how many seconds it will ring 6 times?
 (a) $\frac{33}{2}$ (b) 15
 (c) 12 (d) 22
48. For which value of k, there is no solution to the equation -
 $x - y = 5$
 $kx - 4y = 1$
 (a) 4 (b) 2
 (c) 5 (d) Zero
49. If $\triangle ABC$ and $\triangle DEF$ are similar and $\angle A = 47^\circ$, $\angle E = 83^\circ$, then $\angle C$ is:
 (a) 80° (b) 83°
 (c) 47° (d) 50°
50. What is the length of longest rod which can be kept in a room whose length is 30ft, breadth 24 ft and height 18 ft?
 (a) 25 ft (b) 30 ft
 (c) 42.66 ft (d) 40 ft
51. If $\tan\theta = \frac{4}{3}$, then $\left(\frac{2\sin\theta - 3\cos\theta}{2\sin\theta + 3\cos\theta}\right) = ?$
 (a) 0 (b) -1
 (c) $-\frac{1}{7}$ (d) $-\frac{1}{17}$
52. For which θ value $\frac{\cos\theta}{1-\sin\theta} + \frac{\cos\theta}{1+\sin\theta} = 4$?
 (a) $\frac{\pi}{2}$ (b) $\frac{\pi}{3}$
 (c) $\frac{\pi}{4}$ (d) $\frac{\pi}{6}$
53. The value of $(1 + \cot\theta - \operatorname{cosec}\theta)(1 + \tan\theta + \sec\theta)$
 (a) 0 (b) 1
 (c) 2 (d) 3
54. The solution of $3\tan\theta + \cot\theta = 5 \operatorname{cosec}\theta$
 (a) $\theta = \frac{\pi}{6}$ (b) $\theta = \frac{\pi}{4}$
 (c) $\theta = \frac{\pi}{3}$ (d) $\theta = \frac{\pi}{2}$
55. When $0^\circ \leq \theta \leq 90^\circ$, then solution of $\cos^2\theta + \sin\theta - 2 = 0$ is:
 (a) $\theta = 0^\circ$ or 30° (b) $\theta = 60^\circ$ or 45°
 (c) $\theta = 45^\circ$ or 90° (d) $\theta = 60^\circ$ or 90°
56. The L.C.M of $x^2 - 2x - 3$ and $x^3 + x^2 + x + 1$ is
 (a) $(x + 1)(x - 3)(x^2 + 1)$ (b) $(x^2 + 1)(x + 4)$
 (c) $(x - 1)(x + 3)(x^2 + 1)$ (d) $(x^2 + 3)(x - 1)$
57. The median of the following distribution is:

x	8	5	6	10	9	4	7
f	6	4	5	8	9	6	4

 (a) 5 (b) 7
 (c) 8 (d) 9
58. In the following distribution whose median is 50, find the missing frequency p:

x	10	30	50	70	90
f	17	p	32	24	19

 (a) 25 (b) 26
 (c) 27 (d) 28
59. The ascending order of $\sqrt{2}$, $\sqrt[3]{4}$ and $\sqrt[4]{6}$ is -
 (a) $\sqrt{2}$, $\sqrt[3]{4}$, $\sqrt[4]{6}$ (b) $\sqrt[4]{6}$, $\sqrt[3]{4}$, $\sqrt{2}$
 (c) $\sqrt[4]{6}$, $\sqrt{2}$, $\sqrt[3]{4}$ (d) $\sqrt{2}$, $\sqrt[4]{6}$, $\sqrt[3]{4}$
60. If α , β are the roots of the equation $x^2 - px + q = 0$, then the value of $\alpha^2 + \beta^2$ is
 (a) $p^2 + 2q$ (b) $p^2 - 2q$
 (c) $p(p^2 - 3q)$ (d) $p^2 - 4q$
61. Chemical formula of plaster of paris:
 (a) CaSO_4 (b) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$
 (c) $2 \text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$ (d) $\text{CaSO}_4 \cdot \text{H}_2\text{O}$
62. In water molecule oxygen is
 (a) sp-hybridized (b) sp²-hybridized
 (c) sp³-hybridized (d) Not hybridized
63. Silver nitrate solution is kept in brown bottle in lab. Because
 (a) It reacts with ordinary bottles
 (b) Brown bottle cuts the passage of light through it
 (c) Ordinary bottle retards its decomposition
 (d) Brown bottle does not react with it.
64. The reagent with which both aldehydes & ketones can react easily
 (a) Fehling solution (b) Grignard's reagent
 (c) Schiff's reagent (d) Tollen's reagent
65. Rate constant of a reaction depends on
 (a) Initial concentration of reactants
 (b) Time of reaction
 (c) Extent of reaction
 (d) Temperature



66. The atomic orbital is
 (a) The circular path of electron
 (b) Elliptical shaped orbit
 (c) Three dimensional field around the nucleus
 (d) The region in which there is maximum probability of finding electron
67. How many electrons are there in the last orbit of Chlorine?
 (a) 7 (b) 1
 (c) 2 (d) 4
68. The number of elements in the third period of the Periodic Table:
 (a) 18 (b) 8
 (c) 32 (d) 2
69. While going up in a Group of Periodic Table, the metallic quality
 (a) increases
 (b) remains the same
 (c) decreases
 (d) first increases then decreases
70. In the n th orbit of an atom the maximum, number of electron is
 (a) n^2 (b) $2n^2$
 (c) $n + 2$ (d) $n - 2$
71. Bauxite is ore of
 (a) Iron (b) Aluminium
 (c) Silver (d) Zinc
72. Which of the following will not give Iodoform test?
 (a) Acetone (b) Diethyl ketone
 (c) Ethyl alcohol (d) 2- Pentanol
73. Reduction of Ketones by Zn-Hg/HCl is called
 (a) Wolff-Kishner reduction
 (b) Rosenmund's reduction
 (c) Stephen's reduction
 (d) Clemmensen's reduction
74. Which one of the following will not give a red precipitate of Cu_2O when heated with Benedict's solution?
 (a) Sucrose (b) Fructose
 (c) Glucose (d) Maltose
75. Which of the following alloys contains chromium
 (a) Steel (b) Stainless steel
 (c) Maganalium (d) Brass
76. The ion with the strongest polarizing capacity is:
 (a) Ba^{2+} (b) Cs^+
 (c) Ca^{2+} (d) Li^+
77. The strength of "10 volume H_2O_2 " is
 (a) 3% (b) 6%
 (c) 9% (d) 12%
78. Which of the following is a Lewis acid:
 (a) BF_3 (b) B
 (c) PH_3 (d) CO
79. The electron affinity of the following elements decreases in the order
 (a) F, Cl, Br, I (b) Cl, F, Br, I
 (c) I, Br, Cl, F (d) Cl, F, I, Br
80. Which one of the following is inter halogen:
 (a) $(\text{CN})_2$ (b) KI
 (c) Br_2 (d) ICl
- Directions (81-85):** In the questions below each sentence consists of a word or a phrase which is underlined. The given sentence is followed by four words or phrases. Choose the word *nearest* in meaning to the underlined part.
81. Timely first aid resuscitated the patient.
 (a) soothed (b) revived
 (c) rescued (d) cured
82. His rustic speech and clothes led us to think of him as an ignorant villager.
 (a) unsophisticated (b) strange
 (c) old-fashioned (d) unconventional.
83. The unprecedented drought in several parts of the country this year led to the onset of various diseases.
 (a) assault (b) attack
 (c) outbreak (d) onslaught
84. The thief's shifty eyes betrayed his guilt.
 (a) wily (b) deceitful
 (c) slippery (d) crafty
85. His ragged clothes effectively hide the opulent life he leads at home.
 (a) rich (b) hard-working
 (c) comfortable (d) obscure
- Directions (86-90):** In the following questions choose the one which is most appropriate so that the sentence not only makes sense but is grammatically correct.
86. The good is With the bones.
 (a) buried (b) entered
 (c) cover (d) fleshed
87. Dowry is no longer permitted by law even in marriages
 (a) love (b) bigamous
 (c) polygamous (d) conventional



88. When he left after the cocktail party, he was as As a judge.
(a) sober (b) drunk
(c) wise (d) boring
89. The prisoner was released on Of good behavior.
(a) bail (b) parole
(c) guarantee (d) grounds
90. "Boswell's Life" of Samuel Johnson is considered to be the greatest ever written.
(a) novel (b) essay
(c) Autobiography (d) biography
91. Who took away the peacock throne built by Shahjahan, from India?
(a) Ahmad Shah Abdali (b) Zaman Shah
(c) Nadir Shah (d) Shah Suja
92. The reign of which dynasty is regarded as the 'golden age' of south India?
(a) Pandyas (b) Pallavas
(c) Cholas (d) Vijaynagar
93. Which of the following oceans is the smallest in area
(a) The Indian (b) The Pacific
(c) The Arctic (d) The Atlantic
94. Which zone of the atmosphere makes radio transmission possible?
(a) Troposphere (b) Stratosphere
(c) Ionosphere (d) Exosphere
95. The primary substance used for vulcanizing rubber is
(a) Ammonium hydroxide (b) Isoprene
(c) Zinc oxide (d) Sulphur
96. Soil is eroded by
(a) Water
(b) Wind and water
(c) Water, wind, ocean waves and glaciers
(d) None of the above
97. Who is the External Affairs Minister of India?
(a) Gen V K Singh (b) M J Akbar
(c) S Jayshankar (d) None of these
98. Which among the following states does not have sea on its border?
(a) Odisha (b) Telangana
(c) West Bengal (d) Gujarat
99. Hima Das is a
(a) shooter (b) swimmer
(c) sprinter (d) weight lifter
100. Which Award was awarded to Wing Commander Abhinandan Varthman?
(a) Veer Chakra (b) Param Veer Chakra
(c) kirti Chakra (d) None of these