

BITSAT 2026 May 27 Shift 1 Memory-Based Questions

Physics

1. An ideal engine whose efficiency is 40%, receives heat at 500 K. If required efficiency is 50%, then intake temperature for the same exhaust temperature is
1) 800 K 2) 700 K 3) 400 K 4) 600 K
2. The root mean square speed of molecules of a gas is 1260 m/s. The average speed of the gas molecules is
1) 1161 m/s 2) 1671 m/s 3) 912 m/s 4) 1040 m/s
3. An object on a spring vibrates in a simple harmonic motion at a frequency of 4 hertz and an amplitude of 8 cm. If the mass of the object is 200 g, the spring constant is
1) 40 N/m 2) 160 N/m 3) 126 N/m 4) 109 N/m
4. A heavy rope is suspended from rigid support. A wave pulse is set up at the lower end. Then
1) The pulse travels with uniform speed 2) The pulse will travel with increasing speed
3) The pulse will travel with decreasing speed 4) The pulse cannot travel through rope
5. Two waves of wavelength 50 cm and 51 cm produced 12 beats per second. The velocity of sound is
1) 306 m/s 2) 333 m/s 3) 342 m/s 4) 356 m/s
6. A positive charge is moved from low potential point A to a high potential point B. Then the electric potential energy
1) Increases 2) Decreases
3) Will remain same 4) Nothing definite can be predicted

Chemistry

1. The number of isomers for the complex species $[\text{Co}(\text{en})_2\text{Br}_2]^+$ is
1) 6 2) 3 3) 4 4) 2
2. Chloroform on reaction with O_2 in presence of light gives
1) CO_2 2) COCl_2 3) CO 4) $\text{CCl}_3\text{-CHO}$
3. The correct order of basic strength is
1) Aniline > p-nitroaniline > p-toluidine 2) p-nitroaniline > Aniline > p-toluidine
3) p-toluidine > Aniline > p-nitroaniline 4) p-toluidine > p-nitroaniline > Aniline
4. Phenelzine is an example of
1) Tranquilizer 2) Antimicrobial 3) Analgesic 4) Antiseptic
5. Monomer of orlon is
1) Ethene 2) Acrylonitrile 3) Vinylchloride 4) Tetrafluoroethene
6. Which of the following compounds gives positive carbylamine test?
1) Secondary amine 2) Tertiary amines
3) Primary amine 4) Quaternary ammonium salt

Mathematics

1. If the system of equations
$$\left. \begin{aligned} x - \lambda y - z &= 0 \\ \lambda x - y - z &= 0 \\ x + y - z &= 0 \end{aligned} \right\}$$
 has a unique solution, then the range of λ is $\mathbb{R} - \{a, b\}$. Then the value of $(a^2 + b^2)$ is:
a) 1 b) 2 c) 4 d) 9
2. Let b_1, b_2, \dots , be a geometric sequence such that $b_1 + b_2 = a$ and $\sum_{k=1}^{\infty} b_k = 2$. Given that $b_2 < 0$, then the value of b_1 is :
a) $2 - \sqrt{2}$ b) $1 + \sqrt{2}$ c) $2 + \sqrt{2}$ d) $4 - \sqrt{2}$
3. If M is a 3×3 matrix such that $M^2 = O$, then $\det((I + M)^{50} - 50M)$ where I is an identity matrix of order 3, is equal to :

a) 3

b) 50

c) 2

d) 1

4. The equation of the common tangent touching the circle $(x-3)^2 + y^2 = 9$ and the parabola

$y^2 = 4x$ above the x-axis, is

a) $\sqrt{3}y = 3x+1$ b) $\sqrt{3}y = -(x+3)$ c) $\sqrt{3}y = x+3$ d) $\sqrt{3}y = -(3x+1)$

5. Let T_r be the r^{th} term of a sequence, for $r = 1, 2, 3, \dots$. If $3T_{r+1} = T_r$ and $T_7 = \frac{1}{243}$, then the

value of $\sum_{r=1}^{\infty} (T_r \cdot T_{r+1})$ is

a) $\frac{9}{2}$

b) $\frac{27}{8}$

c) $\frac{81}{8}$

d) $\frac{81}{4}$

6. The negation of the compound proposition $p \vee (\sim p \vee q)$ is

a) $(p \wedge \sim q) \wedge \sim p$ b) $(p \wedge \sim p) \vee \sim q$ c) $(p \vee \sim q) \vee \sim p$ d) $(p \wedge \sim q) \vee \sim p$

7. For the curve defined parametrically as $y = 3 \sin \theta \cdot \cos \theta, x = e^{\theta} \cdot \sin \theta$ where $\theta \in [0, \pi]$, the tangent is parallel to x-axis when θ is :

a) $\frac{3\pi}{4}$

b) $\frac{\pi}{4}$

c) $\frac{\pi}{2}$

d) $\frac{\pi}{6}$

8. The variance of 20 observations is 5. If each observation is multiplied by 2 then the new variance of the resulting observations, is:

a) 5

b) 10

c) 20

d) 40

9. The area bounded by the curve $y = (x-1)(x-2)(x-3)$, x-axis and ordinates $x = 0, x=3$ is :

a) $\frac{9}{4}$

b) $\frac{11}{4}$

c) $\frac{11}{2}$

d) None of these