BITSAT 2023 Question Paper May 23 Shift 1

Time Allowed :3 Hours	**Maximum Marks :**390	**Total Questions :**130

General Instructions

1. The examination is conducted in **Computer-Based Test (CBT)** mode. All questions will appear on the computer screen.
2. The total duration of the examination is **3 hours**. No extra time will be granted under any circumstances.
3. The question paper consists of **Multiple Choice Questions (MCQs)**, each having four options with only one correct answer.
4. Candidates must read each question carefully before selecting the answer. Answers can be changed only within the allotted test duration.
5. The examination follows a **negative marking scheme**. Marks will be deducted for incorrect answers, while unattempted questions will not carry any penalty.
6. Use of **calculators, mobile phones, smart watches, Bluetooth devices, or any other electronic gadgets** is strictly prohibited inside the examination hall.
7. Rough work must be done only on the rough sheets provided at the test center. These sheets must be returned after the examination.
8. Candidates must ensure that they have logged in using the correct credentials. Any discrepancy should be reported immediately to the invigilator.
9. No candidate will be allowed to leave the examination hall before the completion of the test duration.
10. Candidates must maintain discipline and follow all **instructions given by the invigilators**.
11. Any form of **unfair means, impersonation, or misconduct** will lead to immediate disqualification.
12. In case of any technical issue during the examination, candidates should remain seated and inform the invigilator without panic.

1. Minimum value of $5^{\cos 2x} + 5^{\sin 2x}$?

(A) 1
(B) 2
(C) 0
(D) 5

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2. Which substance is used in column Chromatography?

(A) Al_2O_3 and Silica gel

(B) $KMnO_4$
(C) Activated Charcoal
(D) Copper Sulphate

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3. Mercury kept in the refrigerator has length L. If taken out in atmospheric pressure condition, length remains the same due to?
(A) High density of mercury
(B) High surface tension
(C) Negligible thermal expansion
(D) High boiling point

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4. Dipole placed in a sphere, what will be the electric flux?
(A) Zero
(B) Depends on the orientation of the dipole
(C) Infinite
(D) q/ϵ_0

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5. Work done in an isochoric process is always?
(A) Positive
(B) Negative
(C) Zero
(D) Infinite

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6. What is the probability of 53 Fridays in an ordinary year?
(A) 1/7
(B) 2/7
(C) 5/53
(D) 1

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7. If work done on a body is positive, then what will be the sign of kinetic energy?
(A) Increase
(B) Decrease
(C) Zero
(D) Constant

8. $\int \frac{1}{1+\sin x} dx$**?**
(A) $\tan x + \sec x + C$
(B) $\tan x - \sec x + C$
(C) $\sec x - \tan x + C$
(D) $\ln(1 + \sin x) + C$

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9. State Boyle's Law.
(A) $P \propto V$
(B) $P \propto 1/V$
(C) $V \propto T$
(D) $P \propto T$

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10. Bromo toluene + Chlorine → A + H_2O → B + conc NaOH → C + D?
(A) Benzoic Acid + Methanol
(B) Sodium p-bromobenzoate + p-Bromobenzyl alcohol
(C) Toluene + NaBr
(D) No Reaction

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11. Surface tension for a liquid is 1/2 of the other liquid and density is doubled, then if L1 = 10, then L2 = ?
(A) 2.5
(B) 5
(C) 10
(D) 20

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12. Triangular loop at intercepts (a, 0, 0), (0, a, 0) and (0, 0, a), then what is the magnetic moment?
(A) $\frac{Ia^2}{2}(\hat{i} + \hat{j} + \hat{k})$
(B) $\frac{\sqrt{3}Ia^2}{2}$
(C) Ia^2
(D) $3Ia^2$

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13. What are the products of the reaction between Chlorine water in hydrolysis?
(A) HCl and HOCl

(B) HCl only
(C) Cl_2O
(D) $HClO_3$

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14. Mononitration of bromobenzene?
(A) m-Nitrobromobenzene
(B) p-Nitrobromobenzene and o-Nitrobromobenzene
(C) Nitrobenzene
(D) Benzenesulfonic acid

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15. $\int \frac{\sqrt{\tan x}}{\sqrt{\tan x}+\sqrt{\cot x}}dx$**?**
(A) $\frac{1}{2}(x - \ln|\sin x + \cos x|) + C$
(B) $x + C$
(C) $\frac{\pi}{4}$
(D) $\sin x + \cos x$
