RASHTRIYA MILITARY SCHOOL BENGALURU Practice Paper 3

Examination - 2023-24

Class : X Time Allowed: 3 Hours General Instructions :

- 1. This Question Paper has 5 Sections A-E.
- 2. Section A has 20 MCQs carrying 1 mark each
- 3. Section B has 5 questions carrying 02 marks each.
- 4. Section C has 6 questions carrying 03 marks each.
- 5. Section D has 4 questions carrying 05 marks each.
- 6. Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts.
- 7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided.
- 8. Draw neat figures wherever required. Take $\pi = \frac{22}{7}$ wherever required if not stated.

Section - A

Section A consists of 20 questions of 1 mark each.

1.	What do you say about the (a) no solution	e solution of the pair of linear (b) unique solution	r equations $y = 0$ and $y = -$ (c) infinitely solution	5? (d) can't say anything
2.	The HCF and LCM of 378 (a) 6 and 3980	, 180 and 420 of will be (b) 12 and 3780	(c) 6 and 3780	(d) 12 and 3980
3.	The quadratic equation x^2 . (a) two distinct real roots (c) no real roots	$-4x - 3\sqrt{2} = 0$ has	(b) two equal real roots(d) more than 2 real roots	
4.	The 11th term of an AP $-$ (a) -20	5, $\frac{-5}{2}$, 0, $\frac{5}{2}$,, is (b) 20	(c) -30	(d) 30
5.	If $\tan 2A = \cot(A + 60^{\circ})$, v (a) 20°	where $2A$ is an acute angle, t (b) 30°	he value of A will be (c) 60°	(d) 10°
6.	If -1 is a zero of the polyr (a) 4	nomial $f(x) = x^2 - 7x - 8$, then (b) 8	n other zero is (c) 1	(d) –4
7.	Given the linear equation geometrical representation (a) $3x - 5y = 10$	3x + 4y = 9. Select another of the pair so formed is inter (b) $6x + 8y = 18$	r linear equation in these resecting lines. (c) $8x + 12y = 18$	two variables such that the (d) above all

Maximum Marks: 80

- Page 2
- 8. A fraction becomes $\frac{1}{3}$ when 2 is subtracted from the numerator and it becomes $\frac{1}{2}$ when 1 is subtracted from the denominator. The fraction will be
 - (a) $\frac{7}{15}$ (b) $\frac{8}{15}$ (c) $\frac{6}{15}$ (d) $\frac{9}{15}$
- **9.** Which of the following is not the graph of a quadratic polynomial?



- **10.** If the point P(x, y) is equidistant from the points Q(a + b, b a) and R(a b, a + b) then, (a) 2ay = xy (b) bx = ay (c) ab = xy (d) by = ax
- **11.** The quadratic equation $3x^2 + 4\sqrt{3}x + 4$ has
 - (a) two distinct real roots(c) no real roots

- (b) two equal real roots
- (d) more than 2 real roots
- 12. In the given figure, two tangents AB and AC are drawn to a circle with centre O such that $\angle BAC = 120^{\circ}$, then OA is equal to that





In figure, $MN \parallel BC$ and AM: MB = 1:2, then $\frac{ar(\Delta AMN)}{ar(\Delta ABC)}$ 13. = A MNB(a) $\frac{1}{3}$ (b) $\frac{1}{9}$ (c) $\frac{8}{9}$ (d) $\frac{5}{9}$ $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}}$ 14. (a) $\sin\theta - \cos\theta$ (b) $\sec\theta - \tan\theta$ (c) $\sec\theta + \tan\theta$ (d) $\sin\theta + \cos\theta$ 15. Two different dice are tossed together. What is the probability that the number on each die is even ? (a) $\frac{1}{2}$ (b) $\frac{1}{4}$ (c) $\frac{3}{4}$ (d) $\frac{1}{6}$ 16. A circle artist is climbing a 20 m long rope, which is tightly stretched and tied from the top of a vertical pole to the ground, then the height of pole, if the angle made by the rope with the ground level is 30° , is (a) 5 m (b) 10 m (c) 15 m (d) 20 m 17. Ratio of volumes of two cones with same radii is (a) $h_1:h_2$ (b) $s_1: s_2$ (c) $r_1:r_2$ (d) None of these

18. For the following distribution:

Marks	Number of stude	nts	
Below 10	3		
Below 20	12		
Below 30	27		
Below 40	57		
Below 50	75		
Below 60	80		
The modal class is			
(a) 10 - 20	(b) 20 - 30	(c) 30-40	(d) $50-6$

Page 3

In the question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correction option.

- 19. Assertion: Sum of first 10 terms of the arithmetic progression $-0.5, -1.0, -1.5, \dots$ is 31. Reason: Sum of *n* terms of an AP is given as $S_n = \frac{n}{2} [2a + (n-1)d]$ where *a* is first term and *d* common difference.
 - (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
 - (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
 - (c) Assertion (A) is true but reason (R) is false.
 - (d) Assertion (A) is false but reason (R) is true.
- 20. Assertion : If the outer and inner diameter of a circular path is 10 m and 6 m then area of the path is $16\pi m^2$. Reason : If R and r be the radius of outer and inner circular path, then area of path is $\pi(R^2 - r^2)$.
 - (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
 - (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
 - (c) Assertion (A) is true but reason (R) is false.
 - (d) Assertion (A) is false but reason (R) is true.

Section - B

Section B consists of 5 questions of 2 marks each.

- **21.** Write a rational number between $\sqrt{2}$ and $\sqrt{3}$.
- **22.** Find the sum of first 16 terms of the AP 10, 6, 2,

OR

What is the sum of five positive integer divisible by 6.

- **23.** If three points (0, 0), $(3, \sqrt{3})$ and $(3, \lambda)$ form an equilateral triangle, then what is the value of λ ?
- 24. A chord of a circle of radius 10 cm, subtends a right angle at its centre. What is the length of the chord?

OR

In figure, on a circle of radius 7 cm, tangent PT is drawn from a point P such that PT = 24 cm. If O is the centre of the circle, then what is the length of PR?



25. In a family of two children find the probability of having at least one girl.

Section - C

Section C consists of 6 questions of 3 marks each.

- 26. The length, breadth and height of a room are 8 m 50 cm, 6 m 25 cm and 4 m 75 cm respectively. Find the length of the longest rod that can measure the dimensions of the room exactly.
- 27. If triangle ABC is similar to triangle DEF such that 2AB = DE and BC = 8 cm then find EF.
- **28.** If θ be an acute angle and $5 \csc \theta = 7$, then evaluate $\sin \theta + \cos^2 \theta 1$.
- 29. In given figure, two circles touch each other at the point C. Prove that the common tangent to the circles at C, bisects the common tangent at P and Q.



30. In Figure, PQ and AB are two arcs of concentric circles of radii 7 cm and 3.5 cm respectively, with centre O. If $\angle POQ = 30^{\circ}$, then find the area of shaded region.



OR

A horse is tethered to one corner of a rectangular field of dimensions $70 \text{ m} \times 52 \text{ m}$, by a rope of length 21 m. How much area of the field can it graze?

- **31.** Two dice are tossed simultaneously. Find the probability of getting
 - (i) an even number on both dice.
 - (ii) the sum of two numbers more than 9.

OR

In a family of three children, find the probability of having at least two boys.

Page 6

Section - D

Section D consists of 4 questions of 5 marks each.

32. Determine graphically whether the following pair of linear equations :

$$3x - y = 7$$

$$2x + 5y + 1 = 0$$
 has :

- (a) unique solution
- (b) infinitely many solutions or
- (c) no solution.

OR

For Uttarakhand flood victims two sections A and B of class contributed Rs. 1,500. If the contribution of X-A was Rs. 100 less than that of X-B, find graphically the amounts contributed by both the sections.

- **33.** If the mid-point of the line segment joining $A\left[\frac{x}{2}, \frac{y+1}{2}\right]$ and B(x+1, y-3) is C(5, -2), find x, y.
- **34.** In $\triangle ABC$, AD is a median and O is any point on AD. BO and CO on producing meet AC and AB at E and F respectively. Now AD is produced to X such that OD = DX as shown in figure.
 - Prove that : $(1) = EE \parallel BC$
 - $\begin{array}{ccc} (1) & EF \mid \mid BC \\ (2) & AO : AV & AE \end{array}$
 - $(2) \qquad AO: AX = AF: AB$



OR

In the figure, $\angle BED = \angle BDE$ and E is the mid-point of BC. Prove that $\frac{AF}{CF} = \frac{AD}{BE}$.



35. A milk tanker cylindrical in shape having diameter 2 m and length 4.2 m supplies milk to the two booths in the ratio of 3 : 2. One of the milk booths has cuboidal vessel having base area 3.96 sq. m. and the other has a cylindrical vessel having radius 1 m. Find the level of milk in each of the vessels. Use $\pi = \frac{22}{7}$

Section - E

Case study based questions are compulsory.

36. Nidhi and Ria are very close friends. Nidhi's parents own a Maruti Alto. Ria's parents own a Toyota Liva. Both the families decide to go for a picnic to Somnath temple in Gujrat by their own cars.



Nidhi's car travels x km/h while Ria's car travels 5 km/h more than Nidhi's car. Nidhi's car took 4 hrs more than Ria's car in covering 400 km.

- (i) What will be the distance covered by Ria's car in two hour? Write the quadratic equation that describe the speed of Nidhi's car?
- (ii) What is the speed of Nidhi's car?
- (iii) How much time did Ria take to travel 400 km?
- (iv) How much time did Nidhi take to travel 400 km?
- **37.** Width of a Lake : The angle of depression to one side of a lake, measured from a balloon 300 meter above the lake as shown in the accompanying figure, is 45°. The angle of depression to the opposite side of the lake is 30°.
 - (i) Find the width of the lake.
 - (ii) Find the ground distance of balloon from sides of lake.



38. Transport department of a Jaipur wants to buy some Electric buses for the city. For which they wants to analyse the distance travelled by existing public transport buses in a day.



The following data shows the distance travelled by 60 existing public transport buses in a day.

Daily distance travelled (in km)	200-209	210-219	220-229	230-239	240-249
Number of buses	4	14	26	10	6

Base on the above information, answer the following questions.

(i) Find the median class of daily distance travelled ?

(ii) What is the cumulative frequency of the class preceding the median class ? Find the median of the distance travelled.

(iii) If the mode of the distance travelled is 223.78 km, find the mean of the distance travelled by the bus .