Reg. No.: ……

Name: ……

FIRST YEAR HIGHER SECONDARY EXAMINATION SAMPLE QUESTION PAPER

Part III

MATHEMATICS

Time: 2 Hours

Cool-off time: 15 Minutes

Maximum : 60 Scores

General Instructions to Candidates.

- There is a 'Cool off time' of 15 minutes in addition to the writing time.
- Use the 'Cool of time' to get familiar with questions and to plan your answers
- Read questions carefully before answering.
- Read the instructions carefully.
- Calculations, figures and graphs should be shown in the answer sheet itself.
- Malayalam version of the questions is also provided.
- Give equations wherever necessary.
- Electronic devices except non programmable calculators are not allowed in the examination hall.

വിദ്യാർത്ഥികൾക്കുള്ള പൊതു നിർദ്ദേശങ്ങൾ

- നിർദ്ദിഷ്ട സമയത്തിന് പുറമെ 15 മിനിട്ടു 'കൂൾ ഓഫ് ടൈം' ഉണ്ടായിരിക്കും
- 'കൂൾ ഓഫ് ടൈം' ചോദ്യങ്ങൾ പരിചയപ്പെടാനും ഉത്തരങ്ങൾ ആസൂത്രണം ചെയ്യാനും ഉപയോഗിക്കുക
- ഉത്തരങ്ങൾ എഴുതുന്നതിനു മുമ്പ് ചോദ്യങ്ങൾ ശ്രദ്ധാപൂർവ്വം വായിക്കണം
- നിർദ്ദേശങ്ങൾ മുഴുവനും ശ്രദ്ധാപൂർവ്വം വായിക്കണം
- കണക്കു കൂട്ടലുകൾ, ചിത്രങ്ങൾ , ഗ്രാഫുകൾ എന്നിവ ഉത്തരക്കടലാസിൽ തന്നെ ഉണ്ടായിരിക്കണം
- ചോദ്യങ്ങൾ മലയാളത്തിലും നൽകിയിട്ടുണ്ട്
- ആവശ്യമുള്ള സ്ഥലത്തു സമവാക്യങ്ങൾ കൊടുക്കണം
- പ്രോഗ്രാമുകൾ ചെയ്യാനാകാത്ത കാൽക്കുലേറ്ററുകൾ ഒഴികെയുള്ള ഒരു ഇലക്ട്രോണിക് ഉപകരണവും പരീക്ഷ ഹാളിൽ ഉപയോഗിക്കുവാൻ പാടുള്ളതല്ല

Questions (1 - 8) carries 3 marks each. Answer any 6.

1. Let $A = \{x / x$ is an integer, $-\frac{1}{2}, x < \frac{5}{2}\}$

(i) Write $n(A)$ (1)

(ii) Write all subsets of A (2)

2 (i) If $n(A) = 2$, $n(B) = 3$, then the possible numbers of relations from A to B is — (1)

(ii) Let $P = \{1, 2\}$, Find $P \times P \times P$ (2)

3. Solve the ~~follow~~ the inequality $\frac{3x-4}{2} \geq \frac{x+1}{4} - 1$. Show the graph of the solution on the number line (3)

4. (i) If $n_{C_9} = n_{C_8}$, find n (1)

(a) 9 (b) 17 (c) 8 (d) 1

(ii) In how many ways can a committee of 3 persons be formed from a group of 2 men and 3 women (2)

5 (i) Find the centre and radius of the circle $x^2 + y^2 + 8x + 10y - 8 = 0$ (2)

(ii) Is the point $(2, 3)$ lie outside, inside or on the above circle (1)

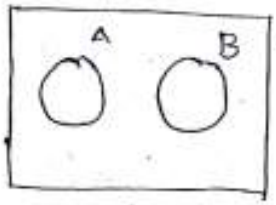
6 (i) Are the points $(0, 7, 10)$, $(-1, 6, 6)$ and $(-4, 9, 6)$, the vertices of a right triangle (3)

7 Evaluate $\lim_{x \to 2} \frac{x^3 - 4x^2 + 4x}{x^2 - 4}$ (3)

8. A bag contains 9 balls of which 4 are Red, 3 are blue and 2 are yellows. A ball is drawn at random from the bag. Calculate the probability that the ball drawn will be (3)

(i) Red (ii) Yellows (iii) either Red or blue

Questions (9-16) carries 4 marks each Answer any 8.

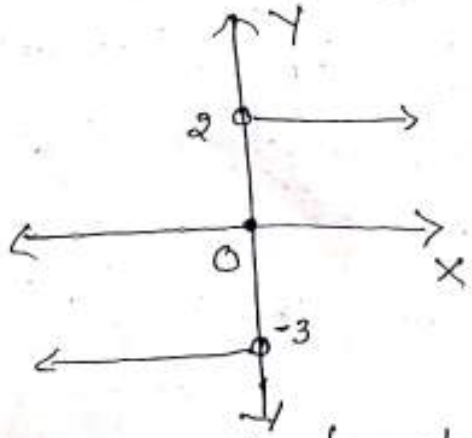
9 (i) If 

then $A \cap B =$ ____ (1)

(ii) If $U = \{a, b, c, d, e, f, g\}$, $A = \{c, d, e, f\}$, $B = \{a, b, c, d\}$, verify that $(A \cup B)' = A' \cap B'$ (3)

10 (i) If $(2x, -1) = (6, y)$, then find the values of x and y (1)

(ii) Consider the ~~function~~ following graph



(a) Write the function (1)

(b) Write the domain and range (2)

(c) Value of i^{-35} = _____ (1)

[1, 0, i, $-i$]

(ii) Let $z = 1 - 3i$

(a) Write $|z|$ (1)

(b) Write the multiplicative inverse of z (2)

12. Find the number of ways of choosing 4 cards from a pack of 52 playing cards? How many of these

(a) four cards are of the same suit

(b) four cards belong to different suits

(c) two are red cards and 2 cards are black cards (4)

13 Find $(a+b)^6 - (a-b)^6$ and hence evaluate $(\sqrt{3}+\sqrt{2})^6 - (\sqrt{3}-\sqrt{2})^6$ (4)

14 (i) Find the sum of infinite terms of the G.P $1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \ldots$ (1)

(ii) Find the sum of n terms of the series $4 + 44 + 444 + \ldots$ n terms (3)

15 Find the co-ordinates of the foci, vertices, length of major axis, minor axis, eccentricity and latus rectum of the ellipse $9x^2 + 4y^2 = 36$ (4)

16 consider the experiment of rolling a die. Let A be the event "getting a prime number", B be the event "getting an odd number" Write the sets representing the events

(i) A or B

(ii) A and B

(iii) A but not B

(iv) not A.

Questions (17 - 20) carries 6 marks each. Answer any 3.

17. (i) If $\cot x = -\frac{5}{12}$, x lies in the second quadrant find the values of $\sin x$, $\cos x$ and $\tan x$ (2)

(ii) Prove that $\frac{\cos 7x + \cos 5x}{\sin 7x - \sin 5x} = \cot x$ (2)

(iii) Find the value of (2)

$$\cot^2 \pi/6 + \operatorname{cosec} \frac{5\pi}{6} + 3\tan^2 \pi/6$$

18 (i) A line through the points (2, 6) and (4, 8) is perpendicular to the line through the points (8, 12) and (x, 24) (2)

Find the value of x

(ii) Find the angle between the lines (4)

$y - \sqrt{3}x - 5 = 0$ and $\sqrt{3}y - x + 6 = 0$

31. (i) Find the derivative of $\sin x$ using first principle of derivatives (3)

(ii) Find the derivative of (3)

$y = (5x^3 + 3x - 1)(x - 1)$

20. Find the mean, variance and Standard deviation of the frequency distribution given below

class	0-30	30-60	60-90	90-120	120-150	150-180	180-200
Frequencies	2	3	5	10	3	5	2

(6)

PREPARED BY WAYANAD CLUSTER

1.JEENA KUTTIAN 2. SHINE C MATHEW
3. AJITHA KUMARI 4. MINI M M
5. MERIN THOMAS 6. GEMINI JOSE
7. MANJU RAVEENDRAN