This Question Paper contains 3 Printed Pages.

15E(A)

MATHEMATICS, Paper - I

(English version)

(Parts A and B)

Time : 2 hrs. 45 min.] ***[Maximum Marks : 40***

Instructions :

1. *15 minutes of time is allotted exclusively for reading the Question paper and 2.30 hours for writing the answers.*
2. ***Part - A** answers should be written in separate answer book.*
3. *There are **three** sections in **Part- A**.*
4. *Answer **all** questions.*
5. *Every answer should be written visibly and neatly.*
6.. *There is an internal choice in **section-III** of **Part- A**.*

Part - A

Time : 2.00 Hours ***Marks : 30***

SECTION - I *(Marks : 4×1=4)*

NOTE : *(i) Answer **all** the questions.*

*(ii) Each question carries **1** mark.*

1. Find the HCF of 60 and 100 by using Euclid division lemma.

2. Write A = {3, 9, 27, 81} in set-builder form.

3. Find the value of k for which the pair of equations $2x + ky + 3 = 0$, $4x + 6y - 5 = 0$ represent parallel lines.

4. Find the volume of right circular cone with radius 3 cm. and height 14 cm.

SECTION - II

(Marks : 5×2=10)

NOTE : *(i)* *Write answers to **all** questions.*

(ii) *Each question carries **2** marks.*

5. Find the zeroes of the polynomial $x^2 - 3$ and verify the relationship between the zeroes and the coefficients.

6. How many three digit numbers are divisible by 3 ?

7. A solid iron rod has a cylinderical shape. Its height is 11 cm and base diameter is 7 cm. Then find the total volume of 50 rods.

8. Find the roots of $x + \frac{6}{x} = 7$, $x \neq 0$.

9. Length of a rectangle is 2 units greater than its breadth. If the area of the rectangle is 120 sq. units, then find its length.

SECTION - III

(Marks : 4×4=16)

NOTE :

1. *Answer **all** the questions.*
2. *Each question carries **4** marks.*

10. *(a)* Hari went to a bank to withdraw ₹ 2000. He asked the cashier to give the cash in ₹ 50 and ₹ 100 notes only. He got 25 notes in all. Can you tell how many notes, each of ₹ 50 and ₹ 100, he received ?

OR

(b) How many spherical balls can be made out of a solid cube of lead, whose edge measures 66 cm. and each ball being 3 cm. in radius ?

11. *(a)* Show that $\sqrt{3}$ is irrational.

OR

(b) If $A = \{x : x \text{ is a natural number}\}$

$B = \{x : x \text{ is an even number}\}$

$C = \{x : x \text{ is an odd number}\}$

$D = \{x : x \text{ is a prime number}\}$

then find $A \cup B$, $A \cap C$, $B \cap C$ and $B \cap D$. What do you notice ?

12. *(a)* The sum of the reciprocals of Rehman's age, (in years) 3 years ago and 5 years from now is $\frac{1}{3}$. Find his present age.

OR

(b) If the sum of first 7 terms and 15 terms of an A.P. are 98 and 390 respectively, then find the sum of first 10 terms.

13. *(a)* Solve the quadratic polynomial $p(x) = x^2 - x - 6$ by graphical method.

OR

(b) The perimeter of a rectangular plot is 32 m. If the length is increased by 2 m. and the breadth is decreased by 1 m., the area of the plot remains the same. Find the length and breadth of the plot. (Use graph)

This Question Paper contains 4 Printed Pages.

15E(B)

MATHEMATICS, Paper - I

(English version)

(Parts A and B)

Time : 2 hrs. 45 min.] ***[Maximum Marks : 40***

Instruction : *Write the answers to the questions in this **Part-B** on the Question paper itself and attach it to the answer book of **Part-A**.*

Part - B

Time : 30 minutes ***Marks : 10***

Note : *(i) Each question has four options. Write the CAPITAL LETTERS (A, B, C, D) showing the correct answer for the following questions in the brackets provided against them.*

*(ii) Marks are **not** awarded for overwritten answers.*

(iii) All questions carry equal marks.

SECTION - IV

(Marks : 20 × ½ = 10)

NOTE : *(i) Answer **all** the questions.*

(ii) Each question carries $\frac{1}{2}$ mark.

14. Which of the following is a terminating decimal ? [ ]

(A) $\frac{10}{81}$ (B) $\frac{41}{75}$

(C) $\frac{8}{125}$ (D) $\frac{3}{14}$

15. The value of $\log_2 32 = ...$ [ ]

(A) 2

(B) 32

(C) $\frac{1}{5}$

(D) 5

16. If '3' is one of the zeroes of $p(x) = x^2 + kx - 9$, then the value of $k = ...$ [ ]

(A) 0 (B) 1

(C) 2 (D) 3

17. The pair of equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ are consistent, then ..... [ ]

(A) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

(B) $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

(C) $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

(D) A and C

18. If α, β, γ are the zeroes of the cubic polynomial $ax^3 + bx^2 + cx + d$ and $(a \neq 0)$, then $\alpha\beta\gamma = ...$ [ ]

(A) $\frac{d}{a}$ (B) $-\frac{d}{a}$

(C) $-\frac{b}{a}$ (D) $\frac{c}{a}$

19. Which term of A.P., 18, 15, 12, ... equals to '0' ? [ ]

(A) 4 (B) 5

(C) 6 (D) 7

20. If $A \subset B$, $n(A) = 4$ and $n(B) = 6$, then $n(A \cup B) =$ ..... [ ]

(A) 10 (B) 6

(C) 4 (D) 2

21. If $k, 2k + 1, 2k + 3$ are three consecutive terms in A.P., then find the value of k. [ ]

(A) 1 (B) 0

(C) 2 (D) 3

22. A quadratic polynomial, whose zeroes are $\sqrt{2}$ and $-\sqrt{2}$ is ..... [ ]

(A) $x^2 - 4$ (B) $x^2 + 4$

(C) $x^2 - 2$ (D) $x^2 + 2$

23. If $a_n = \dfrac{n}{n+1}$, then $a_{2017} =$ ..... [ ]

(A) $\dfrac{2017}{2016}$ (B) $\dfrac{2017}{2018}$

(C) $\dfrac{2017}{2019}$ (D) $\dfrac{2018}{2017}$

24. A cylinder and cone have bases of equal radii and are of equal heights, then their volumes are in the ratio ..... [ ]

(A) 1 : 1 (B) 1 : 3

(C) 3 : 1 (D) 1 : 9

25. Total surface area of a solid hemisphere of radius 7 cm. is .... cm^2. [ ]

(A) 21π (B) 49π

(C) 147π (D) 98π

26. A quadratic equation $ax^2 + bx + c = 0$ has two distinct real roots, if ... [ ]

(A) $b^2 - 4ac > 0$ (B) $b^2 - 4ac < 0$

(C) $b^2 - 4ac = 0$ (D) None of the given

27. The degree of the polynomial $5x^7 - 6x^5 + 7x - 4$ is ..... [ ]

(A) 5 (B) 6

(C) 7 (D) 4

28. n^{th} term of a progression $a, ar, ar^2, ...$ is ..... [ ]

(A) ar (B) ar^2

(C) $a + (n-1)r$ (D) ar^{n-1}

29. Which of the following equations has the solution of $(1, -1)$? [ ]

(A) $3x - 2y = 6$ (B) $3x + 2y = 6$

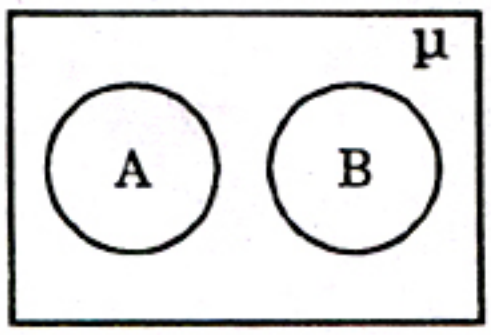
(C) $3x - 2y = 5$ (D) $3x + 2y = 5$

30. If A = {x : x is a letter in the word EXAMINATION},
then its roster form is ..... [ ]

(A) A = {e, x, m, i, n, a, t, o, s} (B) A = {e, x, m, i, n, a, t, o}

(C) A = {e, x, m, a, i, n, t, s} (D) A = {e, x, m, i, n, t, o}

31. The following Venn diagram indicates ..... [ ]



(A) A ⊂ B

(B) B ⊂ A

(C) A, B are disjoint sets.

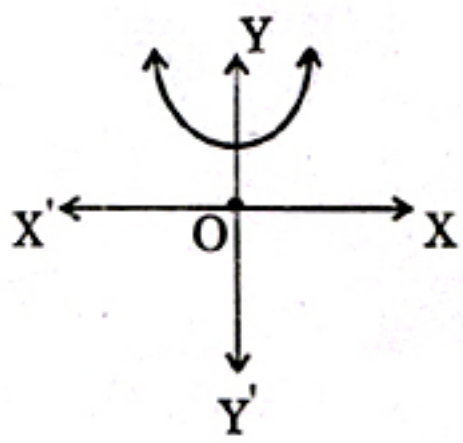
(D) A = B

32. The discriminant of the quadratic equation $px^2 + qx + r = 0$ is ..... [ ]

(A) $p^2 - 4qr$ (B) $q^2 - 4pr$

(C) $q^2 + 4pr$ (D) $r^2 - 4pq$

33. Number of zeroes that can be identified by the following figure ..... [ ]



(A) 0

(B) 1

(C) 2

(D) 3