BK BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
SENIOR SECONDARY CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOL

ANNUAL EXAMINATION - 2024-25

APPLIED MATHEMATICS (241)

Class : 11 com. Duration:3 hrs
Date : 20/02/25 **Marking Scheme** Max. Marks: 80
Admission No.: Roll No.:

Q1 to 20 (1mark each)

1. B) 2
2. B) 1/64
3. C) 256
4. B) 6
5. D) NONE OF THESE
6. B) 10
7. D) NONE
8. C) 27
9. D) 1/2
10. D) Does not exist
11. D) NONE OF THESE
12. A)0
13. C) 3
14. C) 1/3
15. D) NOT DEFINED
16. A)Mean
17. B) 2 Years
18. C) 80C
19. B
20. A
21. Applying rule 1m
    Ans:- 1.4650389 1m
22. Finding slopes 1.5m
    Result 0.5m
23. Identity 1m
    Ans :- log a/b 1m
24. Using formula 1m
    Ans :- 9/1 1m

OR

$\frac{9x8x7}{3x2}$ = 84. 2m

25. $5^x \log 5 + 1/x$ 2m

OR

$2x+xy'+y+2yy' = 0$, $2x+y+y'(x+2y)=0$, $y'(x+2y) = -(2x+y)$, $y' = -\frac{2x+y}{x+2y}$. 2m

26. A's 1 hr ---------- 1/14 of the tank
    B's 1 hr ---------- 1/6 of the tank
    C's 1 hr ---------- 1/12 of the tank 2m
    As per the question

$\frac{1}{14}+\frac{1}{6}-\frac{1}{12}=\frac{1}{3}$. All the three taps together will fill the tank in 3 hrs. 2m

OR

One day's work of A and B together = 1/20
8 day's work of A and B together = 8/20 =2/5
Remaining work = 1-2/5 = 3/5 2m
A's one day work = 1/30
The number of days taken by A to complete the remaining work = 3/5x30/1= 18
Hence, A will finish the remaining work in 18 days. 1m

27. n(A∪B) = n(A-B) +n(B-A) +n (A∩B) = 10+8+3 = 21. 2m
n(A) =n(A-B) +n(A∩B) =10+3 =13 1m

OR

n(A) = 14+2x
n(B) = 3x+x= 4x 1m
since n(A) = n(B)
14+2x=4x
14=2x, x=7. 2m

28. a_3 = 6, a_6 = 48 , a_n = 3072 1m As per question: $\frac{ar^5}{ar^2}=\frac{48}{6}$,r^3= 8, r = 2, a= 3/2 , therefore n-2 =10 =12. 2m
29. 5! X5!x2 required number of ways. 3m

OR

i) ${}^6P_4$= 360
ii) ${}^6P_6$ =720 3m

30. General equation 1m
Cases 1 and 2 2m
31. P(E∩F) = $\frac{26}{52}\frac{25}{51}$. 3m
32. I) ${}^4C_4$ x ${}^{48}C_3$ 1.5m ii) ${}^4C_3$ x ${}^{48}C_4$ 1.5m

OR

P(A∪B) = P(A)+P(B) –P(A∩B) =0.54+0.69-0.35 = 0.88 2.5 m
P(A'∩B') = P(A∪B)' = 1- P(A∪B) = 1-0.88 = 0.12 2.5 m

33. Modal class = 40-50, f_1 = 20, f_0=12, f_2= 11 3m
Mode = l + $\frac{f1-f0}{2f1-f0-f2}$ x h = 40+ $\frac{20-12}{2x20-12-11}$x10 = 44.71 2m

OR

$\sum fd^2$ = 10500, $\sum f$= 50, $\sum fd$=-150 3m
Variance = $\frac{\sum fd^2}{\sum f}$ - $(\frac{\sum fd}{\sum f})^2$ = 210-9 =201. 2m

34. 28121.60 = 25000$(1+\frac{4}{100})^n$
$\frac{2812160}{25000}$ = $(\frac{26}{25})^n$ 3m
$\frac{17576}{15625}=\left(\frac{26}{25}\right)^n$
$\left(\frac{26}{25}\right)^3=\left(\frac{26}{25}\right)^n$ 2m
$n=3$

35. i)C.P of dealer = 40,500 , CGST = 9%of 40500 = 3645, SGST = 9% of 40500= 3645.
C.P. of consumer = 43200, CGST = 9% of 43200 = 3888, SGST = 9% of 43200 = 3888.
The amount tax (under GST) paid by dealer to the central government = 3888-3645 = 243 3m
The amount tax (under GST) paid by dealer to the state government = 3888-3645 = 243.
ii) The amount tax (under GST) received by central government= 3645+243= 3888
The amount tax (under GST) received by state government = 3645+243= 3888. 2m

36. I) EIDCAFHGB 2m
II) C and F 1m
iii) I 1m
37. I) 240 2m
ii) 983040 1m

iii) 1215 1m

38. I) 336 2 m
ii) 6720 2m

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