MATHS

BOOKS - ARIHANT PUBLICATION BIHAR

BIHAR POLYTECHNIC ENTRANCE EXAM (MODEL SOLVED PAPER 2018)

Section Iii Mathmeatics

1. If $A = 4^5 \times 7^3$ and $B = 7^2 \times 4^6$, then what is the value of $A \times B$?

    A. $4^{11} \times 7^5$

    B. $4^{10} \times 7^{18}$

    C. $4^{30} \times 7^6$

    D. $4^7 \times 7^9$

Answer: A

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2. What is the value of 21 + 24 + 27 + ... + 51 ?

A. 324

B. 396

C. 416

D. 288

Answer: B

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3. A number M is divisible by 25. If (M + 5) (M + 1) is divided by 25, then what will be the remainder ?

A. 5

B. 6

C. 1

D. 3

Answer: A

4. $\dfrac{(x + 5)(x^2 + 7x + 10)}{(x + 3)(x^2 + 10x + 25)}$ can be simplifed in

A. $\dfrac{x + 2}{x + 3}$

B. $\dfrac{x - 2}{x - 3}$

C. $\dfrac{x + 5}{x + 3}$

D. $\dfrac{x + 3}{x + 5}$

Answer: A

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5. If LCM and HCF of two expression are (x + 1) and $\left(x^4 - 1\right)$. If one expression is $\left(x^2 - 1\right)$, then another is

A. $x^3 - 1$

B. $(x - 1)\left(x^2 + 1\right)$

C. $x^2 + 1$

D. $(x + 1)\left(x^2 + 1\right)$

Answer: D

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6. A two digit number is four times the sum and three times the product of its digits.

A. 42

B. 24

C. 12

D. 21

Answer: B

7. Two adjacent sides of a right angled triangle are 11 cm and 60 cm. The perimeter of circumcircle of this triangle is

    A. $71\,\pi$ cm

    B. $61\,\pi$ cm

    C. $22\,\pi$ cm

    D. $60\,\pi$ cm

Answer: D

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8. If α and β are the roots of the equation $x^2 - 4x + 1 = 0$, then the value of $\alpha^3 + \beta^3$ is

A. 76

B. 52

C. -52

D. -76

Answer: B

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9. What is the value of

$$(4.6 + 3.1)^2 - (4.6 - 3.1)^2 \ ?$$

A. 54.68

B. 58.86

C. 53.32

D. 57.04

Answer: D

10. The equation of the tangent to the circle $x^2 + y^2 + 4x - 4y + 4 = 0$ which makes equal intercepts on the coordinates axes in given by

    A. x + y = 2

    B. $x + y = 2\sqrt{2}$

    C. x + y = 4

    D. x + y = 8

Answer: B

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11. Which of the following number is an odd and prime number ?

A. 61

B. 87

C. 81

D. 69

Answer: A

12. The value of $1 - \log 2 + \dfrac{\log 2^2}{2} - \dfrac{(\log 2)^3}{3} + \cdots$ is

A. 2

B. $\dfrac{1}{2}$

C. $\log 3$

D. None of these

Answer: B

13. M alone can do a work in 50 days. M is 10% less efficient that N. In how many days can N alone do the same work ?

A. 60 days

B. 45 days

C. 40 days

D. 43 days

Answer: B

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14. Three taps R, S and T can fill a tank in 90, 100 and 180 min respectively. If all the taps are opened together, then in how many minutes will the tank be filled ?

A. 120 min

B. 37.5 min

C. 45 min

D. 90 min

Answer: B

15. Find the area of a rhombus each side of which measures 20 cm and one of whose diagonal is 24 cm

    A. 768

    B. 384

    C. 480

    D. 240

Answer: B

16. A shopkeeper offers 35% discount on shirts which have been marked 60% above the cost price. Ajay bought the shirt for Rs. 728. What was the cost price of the shirt ?

A. Rs. 520

B. Rs. 700

C. Rs. 480

D. Rs. 680

Answer: B

17. $\cos(A - B) = \dfrac{3}{5}$ and $\tan A \tan B = 2$ then

A. cos A cos B = 1/5

B. cos A cos B = -1/5

C. sin A sin B = -2/5

D. sin A sin B = -1/5

Answer: A

18. The cost price of an article is 90% of the marked price. What is the gain percentage after allowing discount of 1% on the marked price ?

A. 0.125

B. 0.2

C. 0.1

D. 0.0833

Answer: C

19. The value of $\tan(-945°)$ is
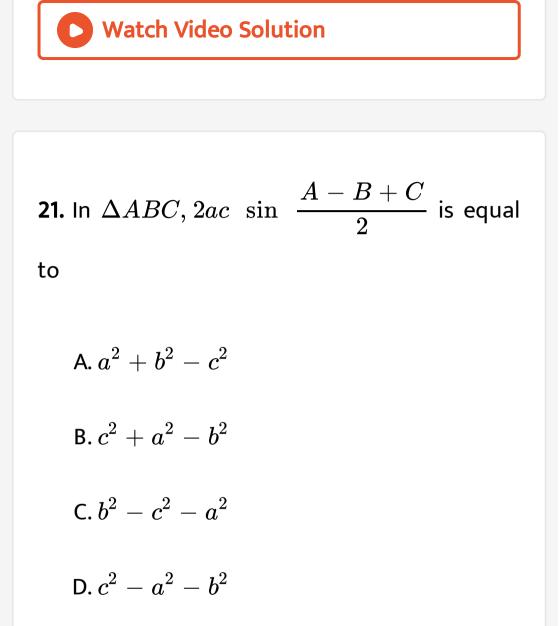
A. -1

B. -2

C. -3

D. -4

Answer: A

20. If $\tan\theta = -\dfrac{4}{3}$, then $\sin\theta$ is

A. $-4/5$ but not $4/5$

B. $-4/5$ or $4/5$

C. $4/5$ but not $-4/5$

D. None of these

Answer: B

21. In $\triangle ABC$, $2ac \ \sin \ \dfrac{A - B + C}{2}$ is equal to

A. $a^2 + b^2 - c^2$

B. $c^2 + a^2 - b^2$

C. $b^2 - c^2 - a^2$

D. $c^2 - a^2 - b^2$

Answer: B

22. The angle of depression of a point situated at a distance of 70 metres from the base of a tower is $45°$. The height of the tower is

A. 70 m

B. $70\sqrt{2}$ m

C. $\dfrac{70}{\sqrt{2}}$ m

D. 35 m

Answer: A

23. The lines $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ are perpendicular to each other , then _____.

A. $a_1b_2 - b_1a_2 = 0$

B. $a_1a_2 + b_1b_2 = 0$

C. $a_1^2b_2 + b_1^2a_2 = 0$

D. $a_1b_1 + a_2b_2 = 0$

Answer: B

24. A man sold 280 chairs and had a gain equal to selling price of 35 chairs. What is his profit percentage ?

A. 0.2

B. 0.1428

C. 0.15

D. 0.1667

Answer: B

25. Average of 12 numbers is 15. If a number 41 is also included, then what will be the average of these 13 numbers ?

A. 16

B. 18

C. 19

D. 17

Answer: D

26. Rs. 1050 is divided among M, N and P in the ratio 3 : 5 : 7 respectively. What is the difference between the shares of M and N ?

    A. Rs. 140

    B. Rs. 210

    C. Rs. 155

    D. Rs. 315

Answer: A

27. In what ratio a man must mix pulses at Rs. 11.10 per kg with Rs. 15.20 per kg pulse so as to make a mixture worth Rs. 13.20 per kg ?

A. $4:3$

B. $16:27$

C. $4:7$

D. $20:21$

Answer: D

28. A man spends 65% of his income and saves the rest. If his income increases by 25% and spending increases by 20%, then what is the percentage change in his savings ?

A. 31.67% increase

B. 34.28% increase

C. 41.66% decrease

D. 29.87% decrease

Answer: B

29. A 100 m long train crosses a 800 m long bridge. If the speed of train 30 km/h, then what is the time taken to cross the bridge ?

A. 105 s

B. 108 s

C. 118 s

D. 120 s

Answer: B

30. What is the sum of money which will become Rs. 201840 at the rate of 16% per annum at compound interest in two years ?

    A. Rs. 160000

    B. Rs. 150000

    C. Rs. 180000

    D. Rs. 200000

Answer: B

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