DU MSc Mathematics Education

Topic:- DU_J19_MSC_ME

1) G_1, G_2, G_3, are the centroids of the triangular faces OBC,OCA,OAB of a tetrahedron OABC. If λ be the ratio of the volume of the tetrahedron to the volume of the parallelepiped with OG_1,OG_2,OG_3 as coterminous edges, then the value of λ is

[Question ID = 14203]

1. 1 /4 [Option ID = 26810]
2. 3 /4 [Option ID = 26811]
3. 9 /4 [Option ID = 26809]
4. 5 /4 [Option ID = 26812]

Correct Answer :-

- 9 /4 [Option ID = 26809]

2) Which of the following is correct ascending order of social media services based on their year of foundation?

[Question ID = 14166]

1. Instagram, Whatsapp, Facebook , Twitter [Option ID = 26664]
2. Facebook , Whatsapp, Twitter, Instagram [Option ID = 26662]
3. Facebook , Twitter, Whatsapp, Instagram [Option ID = 26663]
4. Twitter, Facebook , Instagram, Whatsapp [Option ID = 26661]

Correct Answer :-

- Twitter, Facebook , Instagram, Whatsapp [Option ID = 26661]

3) Which of the following function reflects an amplitude of 2 and a period of 2?

[Question ID = 14146]

1. $Y=4\sin(2\pi)\theta$ [Option ID = 26583]
2. $Y=2\sin\theta$ [Option ID = 26581]
3. $Y=2\sin(\pi / 2)\theta$ [Option ID = 26582]
4. $Y=2\sin(\pi)\theta$ [Option ID = 26584]

Correct Answer :-

- $Y=2\sin\theta$ [Option ID = 26581]

4) Which of the following cannot be an effective method for primary grade students?

[Question ID = 14136]

1. Demonstrating in the class [Option ID = 26543]
2. Hands on activities [Option ID = 26541]
3. Learning by doing [Option ID = 26542]
4. Story Telling [Option ID = 26544]

Correct Answer :-

- Hands on activities [Option ID = 26541]

5) Which of the following agency conducts National Achievement Survey?

[Question ID = 14134]

1. CABE [Option ID = 26536]
2. CBSE [Option ID = 26533]
3. UGC [Option ID = 26535]
4. NCERT [Option ID = 26534]

Correct Answer :-

- CBSE [Option ID = 26533]

6) Which of the following is not a mathematical statement?

[Question ID = 14143]

1. 4 + 3 = 10 [Option ID = 26570]
2. 17 is an odd number. [Option ID = 26569]
3. A fraction can be represented as a unit. [Option ID = 26571]
4. Rational numbers are very useful. [Option ID = 26572]

Correct Answer :-

- 17 is an odd number. [Option ID = 26569]

7) Which one of the following is correct?

[Question ID = 14165]

1. (6-2×12÷3) <(12÷6+2-3)>< (3+12-6×2)< (2×6÷3+12)> [Option ID = 26658]
2. (6-2×12÷3) <(12÷6+2-3)> (3+12-6×2) = (2×6÷3+12) [Option ID = 26659]
3. (6-2×12÷3) < (2×6÷3+12)=""> (12÷6+2-3) < (3+12-6×2) [Option ID = 26660]
4. (3+12-6×2) > (2×6÷3+12)> (6-2×12÷3) >(12÷6+2-3) [Option ID = 26657]

Correct Answer :-

- (3+12-6×2) > (2×6÷3+12)> (6-2×12÷3) >(12÷6+2-3) [Option ID = 26657]

8) Given a + b =50 , a, b, ϵ R^+. If A, G and H are, respectively, the A.M., G.M. and H.M. between the numbers a and b such that the G.M. exceeds H.M. by 4 then (where A >1, G>1, H >1)

[Question ID = 14211]

1. 4(G+H)=A-1 [Option ID = 26843]
2. A + G =30H [Option ID = 26841]
3. A+G=3(H-1) [Option ID = 26844]
4. G+H=A+10 [Option ID = 26842]

Correct Answer :-

- A + G =30H [Option ID = 26841]

9) Rahul, a 2nd grade child is always confused with numerals and struggles in recognizing and writing numbers in spite of repeated practice. What would you suggest as an education counsellor?

[Question ID = 14126]

1. He should be given remedial classes. [Option ID = 26501]
2. He should be shown animated videos on numbers to make him interested in Mathematics. [Option ID = 26503]
3. He should be given extensive drill practice on numbers. [Option ID = 26502]
4. He should be investigated for dyscalculia. [Option ID = 26504]

Correct Answer :-

- He should be given remedial classes. [Option ID = 26501]

10) In context of Education, which of the following includes learners from marginalised group:

[Question ID = 14127]

1. students with advanced learning needs [Option ID = 26508]
2. students with talent in sports [Option ID = 26507]
3. girl students [Option ID = 26505]
4. adult learners [Option ID = 26506]

Correct Answer :-

- girl students [Option ID = 26505]

11) As per National Curriculum Framework 2005, higher aim of teaching Mathematics at school level is:

[Question ID = 14120]

1. developing mathematical literacy. [Option ID = 26480]
2. developing problem solving skills. [Option ID = 26479]

3. developing inner resources of the growing children. [Option ID = 26477]
4. eliminating Mathematics phobia among school students. [Option ID = 26478]

Correct Answer :-

- developing inner resources of the growing children. [Option ID = 26477]

12) Which among the following statement is not true?

[Question ID = 14121]

1. Curriculum is guided by the curriculum framework. [Option ID = 26481]
2. Curriculum is guided by the syllabus. [Option ID = 26482]
3. Curriculum describes content, pedagogy, systematic characteristics and assessment. [Option ID = 26484]
4. Curriculum encompasses all kinds of learning experiences a student will have in school, within classroom and outside classroom. [Option ID = 26483]

Correct Answer :-

- Curriculum is guided by the curriculum framework. [Option ID = 26481]

13) Which among the following is not true?

[Question ID = 14124]

1. Dynamism of the society should be reflected in school education. [Option ID = 26494]
2. A child's socio-cultural background should not interfere with school learning. [Option ID = 26495]
3. Curriculum should be changed periodically due to changing conditions of socio-cultural and economic conditions of the society. [Option ID = 26493]
4. School education should be cultural sensitive. [Option ID = 26496]

Correct Answer :-

- Curriculum should be changed periodically due to changing conditions of socio-cultural and economic conditions of the society. [Option ID = 26493]

14) A teacher performs step by step experiment in the class while students are asked to observe the teacher. This method is called:

[Question ID = 14123]

1. observation [Option ID = 26492]
2. experimentation [Option ID = 26490]
3. deductive approach [Option ID = 26491]
4. demonstration [Option ID = 26489]

Correct Answer :-

- demonstration [Option ID = 26489]

15) *Theory of constructivism* suggests following method of teaching:
I) Exploration

II) Demonstration
III) Questioning
IV) Power point presentation

[Question ID = 14128]

1. I and IV only [Option ID = 26512]
2. I and II only [Option ID = 26509]
3. I and III only [Option ID = 26510]
4. I, II and IV only [Option ID = 26511]

Correct Answer :-

- I and II only [Option ID = 26509]

16) Sameer does not perform well in school exams but his IQ is above average. What can you infer from this?

[Question ID = 14125]

1. Sameer is an underachiever. [Option ID = 26499]
2. Sameer is a problem child. [Option ID = 26498]

3. Sameer is a slow learner. [Option ID = 26500]
4. Sameer has some learning disabilities. [Option ID = 26497]

Correct Answer :-

- Sameer has some learning disabilities. [Option ID = 26497]

17) The idea of bringing National Curriculum Framework, as proposed by National Policy of Education 1986 was aimed to:

[Question ID = 14122]

1. bring national harmony and peace. [Option ID = 26485]
2. develop constitutional system of education in the country. [Option ID = 26486]
3. uphold constitutional values. [Option ID = 26488]
4. evolve national system of education in the country. [Option ID = 26487]

Correct Answer :-

- bring national harmony and peace. [Option ID = 26485]

18) A square is constructed away from the origin. The intercept of the straight line x + y = 2 with the axes as one of its side. If p denotes the perpendicular distance of a side of this square from the origin, then the maximum value of p is

[Question ID = 14202]

1. $\sqrt{2}$ [Option ID = 26805]
2. $2\sqrt{2}$ [Option ID = 26806]
3. $4\sqrt{2}$ [Option ID = 26808]
4. $3\sqrt{2}$ [Option ID = 26807]

Correct Answer :-

- $\sqrt{2}$ [Option ID = 26805]

19) Questioning can be used as an effective method of teaching:

[Question ID = 14139]

1. by rewarding students for right answers. [Option ID = 26555]
2. by grading students while answering. [Option ID = 26554]
3. by punishing students for wrong answers. [Option ID = 26556]
4. by controlling the waiting time of giving answers. [Option ID = 26553]

Correct Answer :-

- by controlling the waiting time of giving answers. [Option ID = 26553]

20) x and y are the sides of two squares such that $y = x - x^2$. The rate of change of area of second square with respect to that of first square is

[Question ID = 14198]

1. $2x^2 - 3x + 1$ [Option ID = 26791]
2. $2x^2 + 3x + 1$ [Option ID = 26789]
3. $3x^2 + 2x + 1$ [Option ID = 26792]
4. $3x^2 + 2x - 1$ [Option ID = 26790]

Correct Answer :-

- $2x^2 + 3x + 1$ [Option ID = 26789]

21) Water is drained from a vertical cylindrical tank by opening a valve at the base of the tank. It is known that the rate at which the water level drops is proportional to the square root of water depth y, where the constant of proportionality k >0 depends on the acceleration due to gravity and the geometry of the hole. If time is measured in minutes and k = 1 / 15, then the time to drain the tank, if the water is 4m deep to start with, is

[Question ID = 14195]

1. 45 min [Option ID = 26778]
2. 80 min [Option ID = 26780]
3. 30 min [Option ID = 26777]
4. 60 min [Option ID = 26779]

Correct Answer :-

- 30 min [Option ID = 26777]

22) If $a_1, a_2, \ldots a_n$ are in H.P., then $a_1a_2+a_2a_3+\ldots a_{n-1}a_n$ will be equal to

[Question ID = 14209]

1. na_1a_n [Option ID = 26834]
2. a_1a_n [Option ID = 26833]
3. $a_1 a_n / 2$ [Option ID = 26836]
4. $(n-1)a_1 a_n$ [Option ID = 26835]

Correct Answer :-

- a_1a_n [Option ID = 26833]

23) A player *A* plays a game against a machine. At each round, he deposits one rupee in a slot and then flips a coin that has a probability (p) of showing a head. If the flipped coin shows head, he gets back the rupee he deposited and one more rupee from the machine; else loses his rupee. Let *A* starts with Rs. 10 and $q= 1- p$. Then the probability that he will drained out with all his rupee coins exactly at the 11th round, is

[Question ID = 14178]

1. q^{11} [Option ID = 26709]
2. $1-q^{11}$ [Option ID = 26710]
3. $pq^{10}+q^{11}$ [Option ID = 26711]
4. 0 [Option ID = 26712]

Correct Answer :-

- q^{11} [Option ID = 26709]

24) Popularly known "Direct To Home" or "DTH" television broadcasting is an example of

[Question ID = 14161]

1. Terrestrial broadcasting [Option ID = 26641]
2. Satellite broadcasting [Option ID = 26643]
3. Cable broadcasting [Option ID = 26642]
4. Mobile broadcasting [Option ID = 26644]

Correct Answer :-

- Terrestrial broadcasting [Option ID = 26641]

25) *Divyaang* refers to the people with:

[Question ID = 14131]

1. disability [Option ID = 26521]
2. spirituality [Option ID = 26523]
3. poverty [Option ID = 26522]
4. intuition [Option ID = 26524]

Correct Answer :-

- disability [Option ID = 26521]

26) *Projects,* as a method of teaching was formalized by

[Question ID = 14129]

1. William Kilpatrick [Option ID = 26515]
2. John Dewey [Option ID = 26513]
3. Howard Gardner [Option ID = 26516]
4. Jean Piaget [Option ID = 26514]

Correct Answer :-

- John Dewey [Option ID = 26513]

27) *The Right of Children to Free and Compulsory Education (Amendment) Act*, 2019 has made the following submission:

[Question ID = 14132]

1. Regular Examination at the end of academic year in grade 5 [Option ID = 26525]
2. Regular Examination at the end of academic year in grade 5 and 8 [Option ID = 26527]
3. Regular examination at the end of academic year in grade 8 [Option ID = 26526]
4. No regular examination till grade 8 [Option ID = 26528]

Correct Answer :-

- Regular Examination at the end of academic year in grade 5 [Option ID = 26525]

28) *Samagra Shiksha,* a flagship program initiated by Ministry of Human Resource Development aims for the holistic education in the following sector:

[Question ID = 14133]

1. Girl child studying in school [Option ID = 26532]
2. Children in the age group of 6-14 years [Option ID = 26530]
3. Children in pre-primary years [Option ID = 26529]
4. Children from pre-primary years to grade XII [Option ID = 26531]

Correct Answer :-

- Children in pre-primary years [Option ID = 26529]

29) Percentile scores are representation of a set of data on a/an:

[Question ID = 14130]

1. interval scale [Option ID = 26519]
2. ordinal scale [Option ID = 26518]
3. ratio scale [Option ID = 26520]
4. nominal scale [Option ID = 26517]

Correct Answer :-

- nominal scale [Option ID = 26517]

30) Aarvi has completed 5 math tests out of 6 and is able to maintain an average grade A+. In order to maintain grade A+, she has to score at least 95% in her remaining tests. Her current average score is 96%. How much should she score to maintain the grade A+?

[Question ID = 14145]

1. 90% [Option ID = 26577]
2. 80% [Option ID = 26580]
3. 92% [Option ID = 26578]
4. 88% [Option ID = 26579]

Correct Answer :-

- 90% [Option ID = 26577]

31) A signal which can be green or red with probability 4/5 and 1/5 respectively; is received by station A and then transmitted to station B. The probability of each station receiving the signal correctly is 3/4. If the signal received at station B is green, then the probability that the original signal is green, is

[Question ID = 14179]

1. 3/5 [Option ID = 26713]
2. 9/20 [Option ID = 26716]
3. 6/7 [Option ID = 26714]
4. 20/23 [Option ID = 26715]

Correct Answer :-

- 3/5 [Option ID = 26713]

32) A student has by mistake interchanged two mathematical signs in the probl{em
{(16 -21 ÷ 7 x 6 + 3)=3}
To correct the problem, the two signs that are required to be interchanged are :

[Question ID = 14162]

1. x and + [Option ID = 26646]
2. ÷ and x [Option ID = 26648]
3. ÷ and + [Option ID = 26645]
4. ÷ and + [Option ID = 26647]

Correct Answer :-

- ÷ and + [Option ID = 26645]

33) If (a + 2b +2c) (a - 2b +2c) = $a^2 + 4c^2$ where a, b, c are non-zero numbers, then a, b, c are in/ satisfy

[Question ID = 14208]

1. $b^2 = a + c/2$ [Option ID = 26832]
2. H.P. [Option ID = 26831]
3. A.P. [Option ID = 26829]
4. G.P. [Option ID = 26830]

Correct Answer :-

- A.P. [Option ID = 26829]

34) If the sides of a triangle are decided by the throw of a single dice thrice, then the probability that the triangle is of maximum area given that it is an isosceles triangle, is

[Question ID = 14182]

1. 1/16 [Option ID = 26728]
2. 1/14 [Option ID = 26727]
3. 1/27 [Option ID = 26726]
4. 1/7 [Option ID = 26725]

Correct Answer :-

- 1/7 [Option ID = 26725]

35) How can a teacher support the additional learning needs of advanced students?
I) by providing enrichment activities.
II) by giving them more challenging questions.
III) by giving them extra practice questions of same level.
IV) by asking them to teach slow learners of the class.

[Question ID = 14141]

1. I and II [Option ID = 26561]
2. II and IV [Option ID = 26564]
3. I, II and III [Option ID = 26562]
4. I, III and IV [Option ID = 26563]

Correct Answer :-

- I and II [Option ID = 26561]

36) In *Deductive Method* of teaching:

[Question ID = 14137]

1. We emphasis on the process of proving the result. [Option ID = 26547]
2. We verify already proven result. [Option ID = 26545]
3. We list out counter examples for which result does not hold true. [Option ID = 26546]
4. We look for further applications of the result. [Option ID = 26548]

Correct Answer :-

- We verify already proven result. [Option ID = 26545]

37) Fill in the blank with the most suitable option.

She is a born _____ because she always tries to look on the bright side of every situation.

[Question ID = 14153]

1. maverick [Option ID = 26612]
2. zealot [Option ID = 26611]
3. optimist [Option ID = 26609]
4. opportunities [Option ID = 26610]

Correct Answer :-

- optimist [Option ID = 26609]

38) Fill in the blank with the most suitable option.

A hypothesis should not only account for what we already know, but should also be _____ by continued observation.

[Question ID = 14157]

1. interpreted [Option ID = 26627]
2. explained [Option ID = 26628]
3. inferred [Option ID = 26625]
4. verified [Option ID = 26626]

Correct Answer :-

- inferred [Option ID = 26625]

39) A Math teacher introduced the concept of Symmetry to her grade 6 students and now wants to give them some homework. Which of the following are not good examples of homework?
I) Complete the exercise on Symmetry from the text book.
II) List out 10 house hold objects which are symmetrical.
III) Identify 10 leaves from a nearby garden which have lines of symmetry.
IV) Buy 5 symmetrical objects from the market for a presentation in the class.

[Question ID = 14138]

1. I and III [Option ID = 26549]
2. I and IV [Option ID = 26550]
3. II and I [Option ID = 26552]
4. II and III [Option ID = 26551]

Correct Answer :-

- I and III [Option ID = 26549]

40) Giving excessive care in choosing right words during interaction often results in the loss of:

[Question ID = 14156]

1. precision [Option ID = 26622]
2. selectivity [Option ID = 26623]
3. spontaneity [Option ID = 26624]
4. credibility [Option ID = 26621]

Correct Answer :-

- credibility [Option ID = 26621]

41) In the below statement, the word burgeoned most nearly means:
The period during which new refrigerators have plunged in electricity use is also a period during which the global market for refrigeration has *burgeoned*.

[Question ID = 14155]

1. diversified [Option ID = 26618]
2. glorified [Option ID = 26619]
3. grown rapidly [Option ID = 26620]
4. become complex [Option ID = 26617]

Correct Answer :-

- become complex [Option ID = 26617]

42) A circle of radius 5 unit touches both the axes and lies in the first quadrant. If the circle makes one complete roll on x-axis along the positive direction of x-axis, then the equation of the circle in the new position is

[Question ID = 14204]

1. $(x - 5 - 10n)^2 + y^2 - 10y = 0$ [Option ID = 26813]
2. $(x - 5 - 10n)^2 + y^2 - 10y + 25 = 0$ [Option ID = 26814]
3. $(x + 5 - 10n)^2 + y^2 - 10y = 0$ [Option ID = 26816]
4. $(x + 5 + 10n)^2 + y^2 - 10y + 25 = 0$ [Option ID = 26815]

Correct Answer :-

- $(x - 5 - 10n)^2 + y^2 - 10y = 0$ [Option ID = 26813]

43) A line of fixed length (a+b) moves so that its ends are always on two fixed perpendicular lines. The locus of the point which divides this line into two proportions of lengths a and b is

[Question ID = 14201]

1. An ellipse [Option ID = 26802]
2. A square [Option ID = 26804]
3. A parabola [Option ID = 26801]
4. A hyperbola [Option ID = 26803]

Correct Answer :-

- A parabola [Option ID = 26801]

44) Consider the Cartesian plane R^2, and let X denote the subset of points for which both coordinates are integers. A coin of diameter 1/2 is tossed randomly onto the plane, then the probability that the coin covers a point of X, is

[Question ID = 14175]

1. $\pi / 16$ [Option ID = 26697]
2. $\pi / 10$ [Option ID = 26699]
3. π^2 [Option ID = 26700]
4. π [Option ID = 26698]

Correct Answer :-

- $\pi / 16$ [Option ID = 26697]

45) 50. Who amongst the following is heading the education panel to frame the New National Education Policy?

[Question ID = 14169]

1. R. Raghurajam [Option ID = 26676]
2. M K Sridhar [Option ID = 26674]
3. K. Kasturirangan [Option ID = 26675]
4. S. Srinivas [Option ID = 26673]

Correct Answer :-

- S. Srinivas [Option ID = 26673]

46) Vygotsky's theory of learning suggests:

[Question ID = 14148]

1. After initial explanation, do not support a child in solving difficult questions. [Option ID = 26591]
2. Individual assignments to each student. [Option ID = 26590]
3. Collaborative problem solving. [Option ID = 26589]
4. Child will learn best in the company of children having IQ lesser than his/her own. [Option ID = 26592]

Correct Answer :-

- Collaborative problem solving. [Option ID = 26589]

47) 49. Karan is born on Tuesday, 1st January 2019. If all months in year 2019 have only 30 days then what will be the weekday on 100st day of the year?

[Question ID = 14168]

1. Monday [Option ID = 26670]
2. Sunday [Option ID = 26671]
3. Friday [Option ID = 26672]
4. Wednesday [Option ID = 26669]

Correct Answer :-

- Wednesday [Option ID = 26669]

48) Highlighting the importance of Mathematics in School Education, National Policy of Education- 1986 made which of the following statement?

[Question ID = 14142]

1. Mathematics Education should help in economic development of the country. [Option ID = 26568]
2. Mathematics learning should train the child for problem solving. [Option ID = 26566]
3. Mathematics learning should build foundation for Science. [Option ID = 26567]
4. Mathematics should be visualized as the vehicle to train a child to think, reason, analyze and to articulate logically. [Option ID = 26565]

Correct Answer :-

- Mathematics should be visualized as the vehicle to train a child to think, reason, analyze and to articulate logically. [Option ID = 26565]

49)

Ravi starts moving 10 m distance from a certain point on a ground in the north direction and then takes following turns one by one after every 10 m distance:



If his friends are standing at every 5 m distance only in east direction from Ravi's initial position then he will meet how many of his friends during the journey?

[Question ID = 14167]

1. 5 [Option ID = 26667]
2. 4 [Option ID = 26666]
3. 3 [Option ID = 26665]
4. 6 [Option ID = 26668]

Correct Answer :-

- 3 [Option ID = 26665]

50) $\int_0^{100} x-[x]\,dx =$ (where [.] represents the greatest integer function)

[Question ID = 14192]

1. 1 [Option ID = 26767]
2. 100 [Option ID = 26765]
3. 0 [Option ID = 26768]
4. 50 [Option ID = 26766]

Correct Answer :-

- 100 [Option ID = 26765]

51) $\int_0^1 x^{2018}(x^{2018}+1009)(x^{2018}+2018)^{1/2018}\,dx =$

[Question ID = 14191]

1. $\frac{1}{2}(2019)^{2019/2018}$ [Option ID = 26761]

2. $\frac{1}{2}(2018)^{2018/2019}$ [Option ID = 26763]

3. $\frac{1}{2}(2018)^{2019/2018}$ [Option ID = 26762]

4. $\frac{1}{2}(2019)^{1/2018}$ [Option ID = 26764]

Correct Answer :-

- $\frac{1}{2}(2019)^{2019/2018}$ [Option ID = 26761]

52)

. The value of $\tan\left(i\ln\left(\frac{a-ib}{a+ib}\right)\right)$ with $i=\sqrt{-1}$ is equal to

[Question ID = 14205]

1. $\frac{2ab}{a^2-b^2}$ [Option ID = 26818]

2. $\frac{2ab}{b^2-a^2}$ [Option ID = 26817]

3. $\frac{a^2-b^2}{a^2+b^2}$ [Option ID = 26820]

4. $\frac{a^2+b^2}{a^2-b^2}$ [Option ID = 26819]

Correct Answer :-

- $\frac{2ab}{b^2-a^2}$ [Option ID = 26817]

53)

If $T_r=\frac{1}{r\sqrt{r+1}+(r+1)\sqrt{r}}$, $r\in N$, then

[Question ID = 14210]

1. $\sum_{r=1}^{n}T_r>1$ [Option ID = 26840]

2. $T_r<T_{r+1}$ [Option ID = 26838]

3. $\sum_{r=1}^{99}T_r=\frac{10}{9}$ [Option ID = 26837]

4. $\sum_{r=1}^{99}T_r=\frac{9}{10}$ [Option ID = 26839]

Correct Answer :-

- $\sum_{r=1}^{99} T_r = \frac{10}{9}$ [Option ID = 26837]

54) Period of $f(x) = [x] + [2x] + [3x] + [4x] + \cdots . + [nx] - \frac{n(n+1)}{2}x$, where $n \in N$, is

[Question ID = 14171]

1. 1 [Option ID = 26682]
2. *N* [Option ID = 26681]
3. *1/n* [Option ID = 26683]
4. 2 [Option ID = 26684]

Correct Answer :-

- *N* [Option ID = 26681]

55)

Let $f : N \to N$ be defined by $f(x) = (x+1)^2 + x - \left[\sqrt{(x+1)^2 + (x+1)}\right]^2$

([.] denotes the greatest integer function). Suppose a, b, c are three distinct natural numbers.

If $\Delta = \begin{vmatrix} f(a) & a^2 & a \\ f(b) & b^2 & b \\ f(c) & c^2 & c \end{vmatrix}$, then Δ is equal to

[Question ID = 14213]

1. -(a+b+c) [Option ID = 26849]
2. a+b+c [Option ID = 26850]
3. -1 [Option ID = 26851]
4. 0 [Option ID = 26852]

Correct Answer :-

- -(a+b+c) [Option ID = 26849]

56)

Consider the quadratic equation $az^2 + bz + c = 0$ where a, b, c and z are complex numbers, then condition that the equation has both roots purely imaginary is (a^* is the complex conjugate of a)

[Question ID = 14206]

1. $\frac{a}{a^*} = \frac{b}{b^*} = \frac{c}{c^*}$ [Option ID = 26823]
2. $-\frac{a}{a^*} = -\frac{b}{b^*} = \frac{c}{c^*}$ [Option ID = 26824]
3. $\frac{a}{a^*} = -\frac{b}{b^*} = -\frac{c}{c^*}$ [Option ID = 26821]
4. $\frac{a}{a^*} = -\frac{b}{b^*} = \frac{c}{c^*}$ [Option ID = 26822]

Correct Answer :-

- $\frac{a}{a^*}=-\frac{b}{b^*}=-\frac{c}{c^*}$ [Option ID = 26821]

57) The function $f(x)=\sin\left(\frac{\pi x}{n!}\right)-\cos\left(\frac{\pi x}{(n+1)!}\right)$ is

[Question ID = 14221]

1. Non periodic [Option ID = 26881]
2. Periodic with period *n* [Option ID = 26884]
3. Periodic, with period 2(*n!*) [Option ID = 26882]
4. Periodic, with period 2*(n+1)!* [Option ID = 26883]

Correct Answer :-

- Non periodic [Option ID = 26881]

58) Let $a_2, a_3 \in R$ such that $|a_2 - a_3| = 6$. If $f(x)=\begin{vmatrix} 1 & a_3 & a_2 \\ 1 & a_3 & 2a_2-x \\ 1 & 2a_3-x & a_2 \end{vmatrix}, x \in R$, then maximum value of $f(x)$ is

[Question ID = 14215]

1. 36 [Option ID = 26860]
2. 12 [Option ID = 26859]
3. 9 [Option ID = 26858]
4. 6 [Option ID = 26857]

Correct Answer :-

- 6 [Option ID = 26857]

59) If $\Delta=\begin{vmatrix} 1 & 1 & 1 \\ {}^{m}C_1 & {}^{m+3}C_1 & {}^{m+6}C_1 \\ {}^{m}C_2 & {}^{m+3}C_2 & {}^{m+6}C_2 \end{vmatrix}=2^{\alpha}3^{\beta}5^{\gamma}$, then $\alpha+\beta+\gamma$ is equal to

[Question ID = 14216]

1. 5 [Option ID = 26862]
2. 7 [Option ID = 26863]
3. 3 [Option ID = 26861]
4. 9 [Option ID = 26864]

Correct Answer :-

- 3 [Option ID = 26861]

60) If $x \in (0, \pi)$ and $\cos x + \sin x = 0.5$, then the value of $\tan x$ is

[Question ID = 14188]

1. $\frac{4+\sqrt{7}}{3}$ [Option ID = 26751]
2. $\frac{-4+\sqrt{7}}{3}$ [Option ID = 26749]

3. $\frac{-4-\sqrt{7}}{3}$ [Option ID = 26752]

4. $\frac{4-\sqrt{7}}{3}$ [Option ID = 26750]

Correct Answer :-

- $\frac{-4+\sqrt{7}}{3}$ [Option ID = 26749]

61)

ABC is a triangle. P, Q, R are points on the sides BC, CA, AB respectively dividing them in the ratio 1:4, 3:2 and 3:7 respectively. The point S divides AB in the ratio 1:3, then the ratio of $(\vec{AP} + \vec{BQ} + \vec{CR})$: $\vec{CS}$ is

[Question ID = 14186]

1. 2 /3 [Option ID = 26741]
2. 2 / 5 [Option ID = 26742]
3. 1 / 3 [Option ID = 26743]
4. 1 / 2 [Option ID = 26744]

Correct Answer :-

- 2 /3 [Option ID = 26741]

62)

. The sum of the series $1-\frac{1}{2}+\frac{1}{3}-\frac{1}{4}+\cdots$ is

[Question ID = 14189]

1. sum does not exist [Option ID = 26754]
2. e^{-1} [Option ID = 26753]
3. ln 2 [Option ID = 26756]
4. 0 [Option ID = 26755]

Correct Answer :-

- e^{-1} [Option ID = 26753]

63) If $f(x)$ be a continuous function defined for $1 \leq x \leq 3, f(x) \in Q$ for all $x \in [1,3], f(2) = 10$, where Q is the set of rational numbers then $f(1.8)$ is

[Question ID = 14184]

1. 1 [Option ID = 26733]
2. 5 [Option ID = 26734]
3. 10 [Option ID = 26735]
4. 20 [Option ID = 26736]

Correct Answer :-

- 1 [Option ID = 26733]

64)

$$\lim_{n\to\infty}\frac{\tan\left(\underbrace{89.9999\ldots9}_{n\ 9's}^{\circ}\right)}{\tan\left(\underbrace{89.9999\ldots9}_{(n-1)\ 9's}^{\circ}\right)}=$$

[Question ID = 14194]

1. 1 [Option ID = 26774]
2. 0.1 [Option ID = 26773]
3. 10 [Option ID = 26776]
4. 1/9 [Option ID = 26775]

Correct Answer :-

- 0.1 [Option ID = 26773]

65) If $\{x\}$ denotes the fractional part of x, then $\left\{\frac{3^{2n}}{8}\right\}, n\in N,$ is equal to

[Question ID = 14219]

1. $\frac{1}{8}$ [Option ID = 26875]
2. $\frac{5}{8}$ [Option ID = 26876]
3. $\frac{3}{8}$ [Option ID = 26873]
4. $\frac{7}{8}$ [Option ID = 26874]

Correct Answer :-

- $\frac{3}{8}$ [Option ID = 26873]

66) If $f(x)=[x]$ and $g(x)=x-[x]$, then which of the following is the zero function

[Question ID = 14172]

1. $(fog)(x)$ [Option ID = 26688]
2. $f(x)g(x)$ [Option ID = 26686]
3. $(f+g)(x)$ [Option ID = 26685]
4. $(f-g)(x)$ [Option ID = 26687]

Correct Answer :-

- $(f+g)(x)$ [Option ID = 26685]

67)

Let $f(x) = xtan^{-1}(x^2) + x^4$ and $f^k(x)$ denotes kth derivative of $f(x)$ with respect to $x, k \in N$. If $f^{2m}(0) \neq 0, m \in N$, then m equals

[Question ID = 14183]

1. m= 8 [Option ID = 26732]
2. m= 2 [Option ID = 26729]
3. m= 1 [Option ID = 26730]
4. m= 4 [Option ID = 26731]

Correct Answer :-

- m= 2 [Option ID = 26729]

68) If l^r means $lnlnln\ldots x$, the ln being repeated r times, then $\int \{xl(x)l^2(x)l^3(x)\ldots l^r(x)\}^{-1}dx$ is equal to

[Question ID = 14223]

1. $l^{r+1}(x) + c$ [Option ID = 26889]
2. $l^{r+2}(x) + c$ [Option ID = 26892]
3. $\frac{l^{r+1}(x)}{r+1} + c$ [Option ID = 26890]
4. $l^r(x) + c$ [Option ID = 26891]

Correct Answer :-

- $l^{r+1}(x) + c$ [Option ID = 26889]

69)
Suppose $f(x) = x^3 + ax^2 + bx + c$, where a, b, c are chosen respectively by throwing a die three times. Then, the probability that $f(x)$ is an increasing function, is

[Question ID = 14180]

1. 16/34 [Option ID = 26720]
2. 3/8 [Option ID = 26718]
3. 2/5 [Option ID = 26719]
4. 4/9 [Option ID = 26717]

Correct Answer :-

- 4/9 [Option ID = 26717]

70)
The antiderivative of $f(x) = \frac{1}{3+5sinx+3cosx}$, whose graph passes through the point (0, 0) is

[Question ID = 14187]

1. $\frac{1}{5}(ln|1 - \frac{5}{3}cot\frac{x}{2}|)$ [Option ID = 26748]
2. $\frac{1}{5}(ln|1 + \frac{5}{3}cot\frac{x}{2}|)$ [Option ID = 26747]
3. $\frac{1}{5}(ln|1 + \frac{5}{3}tan\frac{x}{2}|)$ [Option ID = 26746]
4. $\frac{1}{5}(ln|1 - \frac{5}{3}tan\frac{x}{2}|)$ [Option ID = 26745]

Correct Answer :-

- $\frac{1}{5}(ln|1-\frac{5}{3}tan\frac{x}{2}|)$ [Option ID = 26745]

71) The minimum value of the function defined by $f(x) = max\{x,\ x+1, 2-x\}$ is

[Question ID = 14185]

1. 1 [Option ID = 26739]
2. 3 / 2 [Option ID = 26740]
3. 1/ 2 [Option ID = 26738]
4. 0 [Option ID = 26737]

Correct Answer :-

- 0 [Option ID = 26737]

72)

If x is a positive integer and $f(x) = \begin{vmatrix} x! & (x+1)! & (x+2)! \\ (x+1)! & (x+2)! & (x+3)! \\ (x+2)! & (x+3)! & (x+4)! \end{vmatrix}$, then $f(x)$ is equal to

[Question ID = 14217]

1. $2x!(x+1)!(x+2)!$ [Option ID = 26866]
2. $2x!(x+3)!$ [Option ID = 26867]
3. $2(x+1)!(x+2)!(x+3)!$ [Option ID = 26868]
4. $2x!(x+1)!$ [Option ID = 26865]

Correct Answer :-

- $2x!(x+1)!$ [Option ID = 26865]

73)

The horsepower I of an engine is calculated from $I = \frac{PLAN}{33000}$ where $A = \frac{\pi}{4}d^2$. Assume that an error of 10% may have been made in measuring P, L, N and d. If the greatest possible error in I is $\lambda\%$, then λ must be

[Question ID = 14222]

1. 70 [Option ID = 26887]
2. 0 [Option ID = 26888]
3. 50 [Option ID = 26886]
4. 40 [Option ID = 26885]

Correct Answer :-

- 40 [Option ID = 26885]

74) If p, q, r are the sides of ΔABC and equations $px^2 + qx + r = 0$ and $5x^2 + 12x + 13 = 0$ have a common root, then $\angle C$ is

[Question ID = 14207]

1. 90^0 [Option ID = 26826]
2. 45^0 [Option ID = 26828]
3. 60^0 [Option ID = 26825]

4. 120^{o} [Option ID = 26827]

Correct Answer :-

- 60^{o} [Option ID = 26825]

75)

$$\lim_{x\to 0}\frac{1-\cos x\sqrt{\cos 2x}}{x^2}=$$

[Question ID = 14190]

1. 1 [Option ID = 26759]
2. 2 [Option ID = 26760]
3. 0 [Option ID = 26757]
4. 0.5 [Option ID = 26758]

Correct Answer :-

- 0 [Option ID = 26757]

76) Let $a,\ b,\ c$ be rational numbers and $f: Z \to Z$ be a function given by

$$f(x) = ax^2 + bx + c.$$ Then, $a + b$ must be

[Question ID = 14173]

1. An integer [Option ID = 26690]
2. A natural number [Option ID = 26689]
3. Non-integral rational number [Option ID = 26691]
4. Non-integral Irrational number [Option ID = 26692]

Correct Answer :-

- A natural number [Option ID = 26689]

77)

If $D^*f(x) = \lim_{h\to 0}\frac{(f(x+h))^2-(f(x))^2}{h}$, then the value of $D^*f(x)$ at the point on the curve $y = f(x)$ such that tangent to it are parallel to x-axis, is

[Question ID = 14197]

1. $xf(x)$ [Option ID = 26788]
2. $2f(x)$ [Option ID = 26787]
3. zero [Option ID = 26786]
4. $f(x)$ [Option ID = 26785]

Correct Answer :-

- $f(x)$ [Option ID = 26785]

78)

Let $a, b, c > 0$ and $a, b, c \neq 1$. Let $\Delta = \begin{vmatrix} 1 & \log_a b & \log_a c \\ \log_b a & 1 & \log_b c \\ \log_c a & \log_c b & 1 \end{vmatrix}$, then numerical value of Δ is

[Question ID = 14212]

1. 1 [Option ID = 26848]
2. 2 [Option ID = 26846]
3. -1 [Option ID = 26845]
4. 0 [Option ID = 26847]

Correct Answer :-

- -1 [Option ID = 26845]

79)

Three points (x_1, y_1), (x_2, y_2) and (x_3, y_3) on the curve $y = \frac{x^2+1}{x^2-1}$ have the shortest distance from the point P(0, 1). If $x_1 < x_2 < x_3$, then the value of

$(3x_1 + 6x_2 + 9x_3)^2$ is

[Question ID = 14193]

1. 363 [Option ID = 26770]
2. 108 [Option ID = 26771]
3. 243 [Option ID = 26772]
4. 27 [Option ID = 26769]

Correct Answer :-

- 27 [Option ID = 26769]

80) Four squares are chosen at random on a chessboard. If the probability that they lie on a diagonal line is $\frac{\lambda}{{}^{64}C_4}$, then the value of λ must be

[Question ID = 14177]

1. 504 [Option ID = 26708]
2. 364 [Option ID = 26706]
3. 182 [Option ID = 26705]
4. 252 [Option ID = 26707]

Correct Answer :-

- 182 [Option ID = 26705]

81)

If the system of equations

$$\lambda x_1 + x_2 + x_3 = 1$$

$$x_1 + \lambda x_2 + x_3 = 1$$

$$x_1 + x_2 + \lambda x_3 = 1$$

is inconsistent, then λ equals

[Question ID = 14218]

1. -3 [Option ID = 26871]
2. 5 [Option ID = 26869]
3. -2 [Option ID = 26872]
4. $-\frac{2}{3}$ [Option ID = 26870]

Correct Answer :-

- 5 [Option ID = 26869]

82) Which of the following equation reflects the coordinates in the table below?

X	0	1	2	3
Y	5	10	20	40

[Question ID = 14158]

1. $y = 5x^2$ [Option ID = 26630]
2. $y = 5(2^x)$ [Option ID = 26632]
3. $y = 25(x + 1)$ [Option ID = 26629]
4. $y = 25(x^2 + 1)$ [Option ID = 26631]

Correct Answer :-

- $y = 25(x + 1)$ [Option ID = 26629]

83) Dialing a telephone number, a man forgot the last two digits and remembering only that they are different, dialed them at random. The probability of number being dialed correctly is

[Question ID = 14176]

1. 1/2 [Option ID = 26701]
2. 1/90 [Option ID = 26704]
3. 1/72 [Option ID = 26703]
4. 1/45 [Option ID = 26702]

Correct Answer :-

- 1/2 [Option ID = 26701]

84) If 1 is a twice repeated root of the equation $ax^3 + bx^2 + bx + d = 0$, then

[Question ID = 14196]

1. a -b =0 [Option ID = 26782]
2. b - d = 0 [Option ID = 26783]
3. a = -d = b [Option ID = 26784]

4. a = - b = d [Option ID = 26781]

Correct Answer :-

- a = - b = d [Option ID = 26781]

85) Rashtriya Madhyamik Shiksha Abhiyhan was planned to:

[Question ID = 14147]

1. enhance access to higher education and improve its quality. [Option ID = 26587]
2. enhance access to elementary education and improve its quality. [Option ID = 26586]
3. enhance access to secondary education and improve its quality. [Option ID = 26585]
4. enhance access to primary education and improve its quality. [Option ID = 26588]

Correct Answer :-

- enhance access to secondary education and improve its quality. [Option ID = 26585]

86) International Literacy Day is celebrated every year on which of the following dates?

[Question ID = 14135]

1. 11^{th} November [Option ID = 26539]
2. 11^{th} September [Option ID = 26538]
3. 8^{th} September [Option ID = 26540]
4. 5^{th} September [Option ID = 26537]

Correct Answer :-

- 5^{th} September [Option ID = 26537]

87) What can be inferred about insomnia from the information in the above para?
Sleepless people are a very different breed. They know what insomnia really is: not just the failure to fall asleep, but the fear of that failure. For an insomniac, there is no such thing as a good night. Every evening is shredded by anxiety. To reach sleep, the insomniac must first pass through terror.

[Question ID = 14154]

1. a psychological ailment [Option ID = 26614]
2. a physical ailment [Option ID = 26613]
3. D. a mental illness [Option ID = 26616]
4. an imaginary ailment [Option ID = 26615]

Correct Answer :-

- a physical ailment [Option ID = 26613]

88) Let $x = 33^n$. The index *'n'* is given a positive integral value at random. The probability that the value of x will have 3 at the unit place, is

[Question ID = 14181]

1. 1/6 [Option ID = 26724]
2. 1/2 [Option ID = 26722]
3. 1/4 [Option ID = 26721]
4. 1/3 [Option ID = 26723]

Correct Answer :-

- 1/4 [Option ID = 26721]

89) Media and Entertainment industry has several segments. Which of following segment contributes the largest revenue share to the Indian Media and Entertainment Industry:

[Question ID = 14163]

1. Television [Option ID = 26650]
2. Film [Option ID = 26649]
3. Radio [Option ID = 26651]
4. Print [Option ID = 26652]

Correct Answer :-

- Film [Option ID = 26649]

90) The main objective of NITI Aayog is to:

[Question ID = 14152]

1. provide security and intelligence inputs to Government of India [Option ID = 26607]
2. provide directional and policy inputs to Government of India. [Option ID = 26605]
3. provide foreign policy inputs to Government of India. [Option ID = 26606]
4. provide legal support and advice to Government of India. [Option ID = 26608]

Correct Answer :-

- provide directional and policy inputs to Government of India. [Option ID = 26605]

91) The Director of the Film "Mulk" is :

[Question ID = 14164]

1. Dibakar Banerjee [Option ID = 26654]
2. Anubhav Sinha [Option ID = 26655]
3. Sanjay Leela Bhansali [Option ID = 26653]
4. Karan Johar [Option ID = 26656]

Correct Answer :-

- Sanjay Leela Bhansali [Option ID = 26653]

92) The idea of Lab Schools advocated by John Dewey was an example of:

[Question ID = 14159]

1. progressive School [Option ID = 26634]
2. factory School [Option ID = 26633]
3. common Schools [Option ID = 26636]
4. public Schools [Option ID = 26635]

Correct Answer :-

- factory School [Option ID = 26633]

93) The audible frequency range is :

[Question ID = 14160]

1. 93.2 MHz to 107.5MHz [Option ID = 26640]
2. 20 KHz to 20 MHz [Option ID = 26637]
3. 0 to 20 Hz [Option ID = 26639]
4. 20 Hz to 20 KHz [Option ID = 26638]

Correct Answer :-

- 20 KHz to 20 MHz [Option ID = 26637]

94) The solution set of
$x+2y+z=1$
$2x-3y-w=2$
with $x,y,z,w,\geq 0$ is

[Question ID = 14214]

1. An empty set [Option ID = 26856]
2. An infinite set [Option ID = 26854]
3. A singleton set [Option ID = 26855]
4. A finite non-empty set with more than one element. [Option ID = 26853]

Correct Answer :-

- A finite non-empty set with more than one element. [Option ID = 26853]

95) The mean of a set of 40 observations is 12. If each observation is multiplied by a non-zero constant μ and then each of them is decreased by 25, the new mean remains the same. Then the value of μ will be:

[Question ID = 14144]

1. equal to 1 [Option ID = 26575]
2. less than 1 [Option ID = 26573]
3. more than 1 [Option ID = 26574]
4. will lie between 0 and 1 [Option ID = 26576]

Correct Answer :-

- less than 1 [Option ID = 26573]

96) The National Council for Teacher Education (NCTE) is responsible for:

[Question ID = 14151]

1. granting funds to conduct research in the field of teacher education. [Option ID = 26601]
2. granting recognition to teacher education institutes. [Option ID = 26602]
3. promoting international collaborations in the field of teacher education. [Option ID = 26603]
4. conducting National Eligibility Test for appointing teachers in higher education institutes. [Option ID = 26604]

Correct Answer :-

- granting funds to conduct research in the field of teacher education. [Option ID = 26601]

97) The following are the characteristics of a well-planned curriculum, except:

[Question ID = 14149]

1. Flexible [Option ID = 26595]
2. Child-centered [Option ID = 26593]
3. Conservative [Option ID = 26594]
4. Resourceful [Option ID = 26596]

Correct Answer :-

- Child-centered [Option ID = 26593]

98) The number of real solutions of the equation $\log_{0.5}|x|=2|x|$ is

[Question ID = 14174]

1. 1 [Option ID = 26693]
2. 2 [Option ID = 26694]
3. 0 [Option ID = 26695]
4. 3 [Option ID = 26696]

Correct Answer :-

- 1 [Option ID = 26693]

99) Schools need to become centres that prepare children for life and ensure that all children, especially the differently abled, children from marginalised sections, and children in difficult circumstances get the maximum benefit of this critical area of education. — This observation found in the National Curriculum Framework-2005 is related to

[Question ID = 14150]

1. Critical pedagogy [Option ID = 26600]
2. Constructivist learning [Option ID = 26598]
3. Gender equality [Option ID = 26599]
4. Inclusive education [Option ID = 26597]

Correct Answer :-

- Inclusive education [Option ID = 26597]

100) You are a teacher and one of the student of your class makes constant fun of you and disturbs the teaching. What action will you take?

[Question ID = 14140]

1. You will ignore him and will focus on other students. [Option ID = 26559]
2. You will suspend him for few days from attending your class. [Option ID = 26558]
3. You will talk to him and will try to find out the reason. [Option ID = 26557]
4. You will report the matter to the Principal and will ask for exemplary action so that no student does it again. [Option ID = 26560]

Correct Answer :-

- You will talk to him and will try to find out the reason. [Option ID = 26557]