# JADAVPUR UNIVERSITY

UNDERGRADUATE ENTRANCE TEST 2022

ECONOMICS

General Instructions

- Candidates must show their Admit Cards on demand.

- Candidates are not allowed to carry mobile phones and/or digital watches inside the examination hall.

- Only Scientific Non-programming Calculators can be used for the purpose of calculation.

- This question paper booklet contains 50 questions and candidates are required to answer all questions.

- All questions carry equal marks.

- All questions are of objective type having four answer options for each.

- There is only one correct option for every multiple choice question (MCQ). Marks will not be awarded for answering more than one option.

- A right answer will carry **01** mark and **0.25** mark will be deducted for a wrong answer.

- Questions must be answered on the OMR sheet by darkening the appropriate bubble marked A, B, C or D.

- Use only **black ballpoint pen** to mark the answer by completely filling the respective bubble.

- Write question booklet number and your roll number carefully in the specified locations of the OMR answer sheet.

- To write in your Roll No. in the OMR sheet, darken the circle of only the last five digits of the roll number.

- Rough work must be done on the question paper itself. Additional blank pages are given at the end in the question paper booklet for rough work.

- Handover the OMR answer sheet to the invigilator before leaving the examination hall.

- This paper contains questions in English only.

- The OMR answer sheet is liable to become invalid if there is any mistake in filling the correct bubbles for question booklet number / roll number or if there is any discrepancy in the name/signature of the candidate. The OMR answer sheet may also become invalid due to folding or putting stray marks on it or any damage to it. The candidate is solely responsible for such invalidation due to incorrect marking or careless handling of the OMR sheet.

- No candidate shall be allowed to leave the Hall till one hour of commencement of the Examination.

- Candidate found taking an unfair means is liable to be expelled from the examination and all the papers in which (s)he has already appeared are liable to be rejected.

1. In a dinner party both fish and meat were served. Some took only fish and some only meat. There were some vegetarians who did not accept either. The rest accepted both fish and meat. Which of the following logic diagrams correctly reflects this situation?

A)

B)

C)

D)
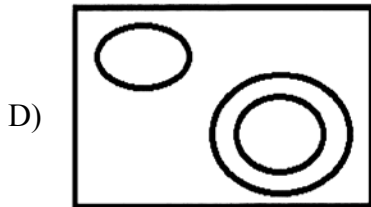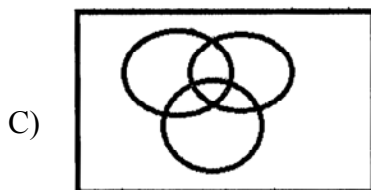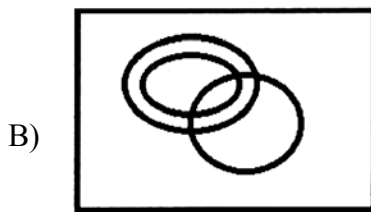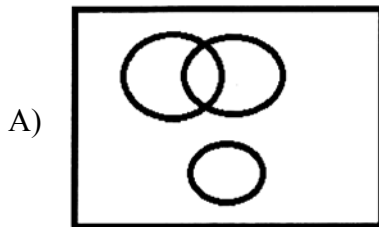
2. If Z=26, NET=39, then NUT=?

   A) 50;

   B) 53;

   C) 55;

   D) 56.

3. A person starts from a point A and travels 3 km eastwards to B and then turns left and travels thrice that distance to reach C. He again turns left and travels five times the distance he covered between A and B and reaches his destination D. The shortest distance between the starting point and the destination is

   A) 12 km;

   B) 15 km;

   C) 16 km;

   D) 18 km.

4. Pointing towards a person, a man said to a woman, "His mother is the only daughter of your father." How is the woman related to that person?

   A) Aunt;

   B) Sister;

   C) Mother;

   D) Cousin.

5. In a certain code language, 'go for morning walk' is written '$*?#', 'good for health' is written as '£?@' and 'good to walk fast' is written as '+@↑#', then what is the code of 'health' in the code language?

   A) +;

   B) #;

   C) £;

   D) ?.

6. If x, y, z are positive real numbers then which of the following is most appropriate?

   A) $\dfrac{(x^2+1)(y^2+1)(z^2+1)}{xyz} \geq 8$

   B) $\dfrac{(x^2+1)(y^2+1)(z^2+1)}{xyz} \geq 0$

   C) $\dfrac{(x^2+1)(y^2+1)(z^2+1)}{xyz} \geq 4$

   D) $\dfrac{(x^2+1)(y^2+1)(z^2+1)}{xyz} \geq 2$

7. A polygon has 44 diagonal. Find the number of its side.

   A) 10

   B) 11

   C) 9

   D) 12

8. How many 5 digits telephone numbers can be constructed using the digits 0 to 9 if each number starts with 67 and no digits appear more than once?

   A) 330

   B) 240

   C) 336

   D) 156

9. Find the number of integers between 100 and 1000 that are divisible by 7.

   A) 120

   B) 128

   C) 126

   D) 127

10. If each term of an infinite G.P. is twice the sum of all terms following it, then find the common ratio of G.P.

   A) $\frac{1}{4}$

   B) $\frac{2}{3}$

   C) $\frac{1}{2}$

   D) $\frac{1}{3}$

11. Evaluate $1 + \frac{1+2}{2!} + \frac{1+2+2^2}{3!} + \frac{1+2+2^2+2^3}{4!} + \cdots \infty$

   A) 4.671

   B) 2.718

   C) 5.437

   D) 1

12. Find $\lim\limits_{x \to 1} \dfrac{x^{\frac{3}{7}} - 1}{x^{\frac{2}{5}} - 1}$.

   A) 1

   B) 0

   C) 2.037

   D) 1.071

13. Evaluate $\int_{2}^{4} \dfrac{dx}{(x-3)\sqrt{2x^2 - 12x + 17}}$

   A) 2.5

   B) 1n2

   C) 180°

   D) −1

[5]

14. Find the area (in sq. units) entrapped by $y^2 = 2x+1$ and $x-y-1=0$.

    A) 5

    B) 4.67

    C) 16

    D) 8.5

15. Two particles start their journey together from rest along a straight line in the same direction. The first particle moves at constant velocity of 20 ft/sec and the second particle moves at constant acceleration of 5 ft/sec². What is the maximum distance between the particles along the path before they meet again?

    A) 32

    B) 35

    C) 40

    D) 42

16. The solution of the initial value problem $x^2 \dfrac{dy}{dx} + xy = 1$, $x>0$, $y(1)=2$ is

    A) $y = \dfrac{\log_e x}{x}$;

    B) $y = \dfrac{\log_e x + c}{x}$;

    C) $y = \dfrac{\log_e x + 1}{x}$;

    D) $y = \dfrac{\log_e x + 2}{x}$.

17. The value of the $\int_0^\pi \sin^2 x \, dx$ is

    A) $\dfrac{\pi}{4}$;

    B) π;

    C) $\dfrac{\pi}{3}$;

    D) $\dfrac{\pi}{2}$.

2022-ECONOMICS-D

18. If the graph of the function $f(x) = \left| x - \dfrac{a+b}{2} \right| + \left| x - \dfrac{a-b}{2} \right|$ where $a > b > 0$ has kink at $x = 5$ and $x = 2$ (i.e. the function is not differentiable at $x = 5$ and $x = 2$) then,

    A) $a = 7, b = 3$;

    B) $a = 6, b = 4$;

    C) $a = 8, b = 2$;

    D) $a = 10, b = 0$.

19. If $C_r^n = \dfrac{n!}{r!(n-r)!}$ then $\sum_{i=0}^{n} (i+1)C_i^n$ is

    A) $2^{n-1}n$;

    B) $2^{n-1}(n+1)$;

    C) $2^{n-1}(n+2)$;

    D) $2^{n-1}(n+3)$.

20. Consider the following three sums $S_1 = 1^2 + 3^2 + \cdots + (2n-1)^2$; $S_2 = 2^2 + 4^2 + \cdots + (2n)^2$ and $S_3 = 1.2 + 3.4 + \cdots + 2n.(2n-1)$ then which of the following is true?

    A) $S_1.S_2 \leq S_3^2$;

    B) $S_1.S_2 \geq S_3^2$;

    C) $S_1.S_2 < S_3^2$;

    D) $S_1.S_2 > S_3^2$.

21. A natural number is selected at random from the set $x = \{x : 1 \leq x \leq 100\}$. The probability that the number satisfies the $x^2 - 13x \leq 30$ inequality is ?

    A) $\dfrac{5}{9}$

    B) $\dfrac{9}{50}$

    C) $\dfrac{3}{20}$

    D) $\dfrac{7}{9}$

22. A five-digit number divisible by 3 is to be formed using digits 0, 1, 2, 3, 4 and 5 without repetition, the total number of ways this can be done, is
    A) 122
    B) 210
    C) 216
    D) 217

23. How many terms are identical in the AP 1, 3, 5, ..., upto 120 terms and 3, 6, 9, ... upto 80 terms?
    A) 39
    B) 40
    C) 41
    D) 34

24. What should come in place of the question mark in the following number series?
    12, 15, 36, ?, 480, 2415, 14508
    A) 115
    B) 109
    C) 117
    D) 121

25. Let $f(x) = g(h(x))$ where $g(x) = x^3 + x^2 - 1$, $h(x) = x^2 - 2$, $f'(x) = ?$
    A) $(x^2 - 2)(3x^2 - 4)$
    B) $2(x^3 + x^2 - 1)$
    C) $6x(x^2 - 2)^2 + 4x(x^2 - 2)$
    D) $(x^3 + x^2 - 1)(3x + 2)^2$

26. How many 4 digit numbers can be formed in which all the digits are different?
    A) 4536
    B) 5040
    C) 3024
    D) 6534

27. $f(x) = \|x| - 1\|$ is not differentiable at $x =$
    A) $0, \pm 1$
    B) ± 1
    C) 0
    D) 1

28. The value of $\int_{-2}^{3}\left|1-x^2\right|dx$ is

    A) $\dfrac{28}{3}$

    B) $\dfrac{1}{3}$

    C) $\dfrac{7}{3}$

    D) $\dfrac{2}{3}$

29. $\sin\left\{2\cos^{-1}\left(-\dfrac{3}{5}\right)\right\}$ is equal to

    A) $\dfrac{6}{25}$

    B) $\dfrac{24}{25}$

    C) $\dfrac{4}{5}$

    D) $-\dfrac{24}{25}$

30. A ball is dropped from a height of 96 feet and it rebounds $\dfrac{2}{3}$ of the height it falls. If it continues to fall and rebound. Find the total distance that the ball can travel before coming to rest.

    A) 240 ft

    B) 360 ft

    C) 480 ft

    D) 290 ft

31. An enormous amount of loot has been stolen from a store. The criminal (or criminals) took the heist away in a car. Three well known criminals, A, B, and C, were brought by police for questioning. The following facts were ascertained. First, nobody other than A, B, C was involved. Second, C never pulls a job without using A (and possibly others) as an accomplice. Third, B does not know how to drive. Which of the following is true?

    A) A is guilty.

    B) B is guilty.

    C) C is guilty.

    D) None of the above

32. There is a certain island whose inhabitants are either knights (who always speak the truth) or knaves (who always lie). An inspector of police was called to this island to help find a criminal named Arthur York. The difficulty is that it was not known if Arthur York was a knight or knave. One suspect was brought to trial. Here is the transcript of the trial.

    Inspector: What do you know about Arthur York?

    Defendant: Arthur York once claimed that I was a knave.

    Inspector: Are you by any chance Arthur York?

    Defendant: Yes.

    Which of the following is true?

    A) The defendant is a knight.

    B) The defendant is Arthur York.

    C) The defendant is a knight but not Arthur York.

    D) The defendant is a knave but not Arthur York.

33. Given two people, A and B, both of whom are either knights (who always speak the truth) or knaves (who always lie), A says "If B is a knight then I am a knave." What are A and B?

    A) A knight, B knave

    B) A knave, B knight

    C) Both knights

    D) Both knaves

34. There is a certain club whose members are all barbers called the Barbers' Club. The following facts are known about it.

   Fact 1 : Every member has shaved at least one member.

   Fact 2 : No member has ever shaved himself.

   Fact 3 : No member has ever been shaved by more than one member.

   Fact 4 : There is one member who has never been shaved at all.

   What is the number of members of the club?

   A) 0
   B) 2
   C) 3
   D) infinitely many

35. Suppose I offer you one of three prizes – Prize A, Prize B or Prize C. Prize A is the best of the three, Prize B is middling and Prize C is the consolation prize. You are to make a statement; if the statement is true, then I promise to award you either Prize A or Prize B; but if your statement is false, then you get Prize C. Of course it is easy for you to be sure to win either Prize A or Prize B; all you need to say is "Two plus two is four." But suppose you have your heart set on Prize A. What statement could you make which would force me to give you Prize A?

   A) I shall get Prize A
   B) I shall not get Prize A
   C) I shall get Prize B
   D) I shall not get Prize B

Study the following information carefully and answer the questions from 36 - 40.

   B, M, T, R, K, H and D are travelling in a train compartment with III-tiers sleeper berth. Each of them has a different profession of Engineer, Doctor, Architect, Pharmacist, Lawyer, Journalist and Professor. They occupied two lower berths, three middle berths and two upper berths. B, the Engineer, is not on the upper berth. The Architect is the only other person who occupies the same type of berth as that of B, M and H are not on the middle berth and their professions are Professor and Lawyer respectively. T is a Pharmacist. D is neither a Journalist nor an Architect. K occupies the same type of berth as that of the doctor.

36. Which of the following combinations of person-berth-profession is correct?

   A) K-Upper-Lawyer
   B) D-Upper-Doctor
   C) M-Lower-Journalist
   D) R-Lower-Architect

37. Which of the following groups occupies the middle berth?

    A) DKT

    B) HKT

    C) DKR

    D) DHT

38. Which of the following pairs occupy the lower berth?

    A) BT

    B) BD
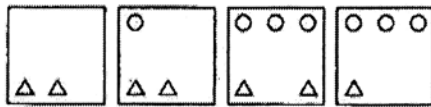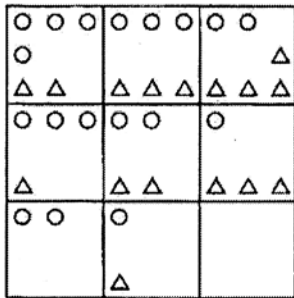
    C) BK

    D) None of these

39. What is D's profession?

    A) Pharmacist

    B) Lawyer

    C) Doctor

    D) Engineer

40. Who is at the Architect?

    A) D

    B) H

    C) R

    D) Data inadequate

41. Out of the given answer figures, which is the correct one to replace the empty box?

A) d

B) c

C) b

D) a

42. If PAINT is coded as 74128 and EXCEL IS CODED AS 93596 then how would you encode ACCEPT?

A) 455978

B) 547978

C) 554978

D) 735961

43. Nikhil gets Rs. 250 from his parents every week for his expenses. He puts Rs. 5 in his piggy bank on everyday except Sunday when he puts Rs. 10 in the piggy bank. He eats subsidized lunch in the college canteen for Rs. 10 on all college days except Saturday when he treats himself to the special lunch for Rs. 25. Bus fare to college is Rs. 4 each way. He has got a holiday on Sunday. This week, Nikhil wants to buy a book which costs Rs. 100. For this, he was walking to and from the college. He is left with Rs. 3 after buying the book. Assuming no other expenses, how many times did Nikhil walk this week?
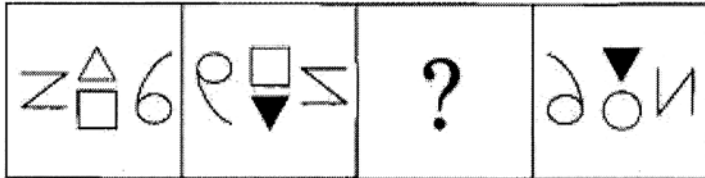
A) 2

B) 3

C) 4

D) 5

44. In the given letter series, some of the letters are missing which are given in that order as one of the options below it. Choose the correct option.

a_cb_abcb_a_cbc_bcbc

A) cccbc
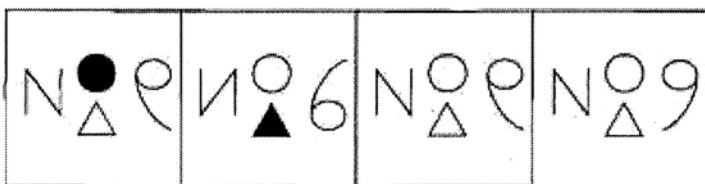
B) cbbac

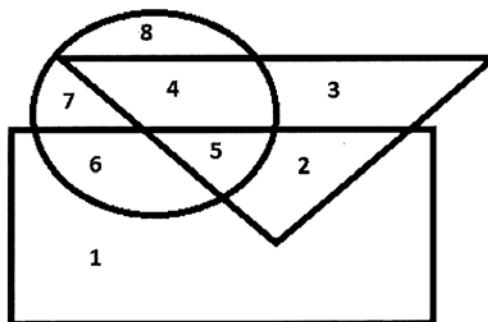C) bccba

D) abbba

45. What will replace the question mark?

Options:

(1) (2) (3) (4)

A) (1)

B) (2)

C) (3)

D) (4)

Answer the question number 46, 47 and 48 based on the following diagram below where triangle represents doctors, the circle represent players and the rectangle represents artists.

46. Which number represents artists who are also players only?

A) 4

B) 6

C) 7

D) 8

47. Which numbers represents players who are neither artists nor doctors?

    A) 1, 2

    B) 3, 4

    C) 6, 7

    D) 7, 8

48. Which number space in the diagram represents doctors who are also players and artists?

    A) 2

    B) 3

    C) 4

    D) 5

49. Find the odd pair.
    A) 45, 27

    B) 30, 18

    C) 20, 10

    D) 15, 12

50. Find the missing value.

9	36	25
4	16	9
1	9	4
6	13	?

    A) 5

    B) 10

    C) 11

    D) 15