

PUBDET-2019
Subject : ECONOMICS

(Booklet Number)

Duration : 90 Minutes

Full Marks : 100

INSTRUCTIONS

1. All questions are of objective type having four answer options for each. Only one option is correct. Correct answer will carry full marks 2. In case of incorrect answer or any combination of more than one answer, $\frac{1}{2}$ mark will be deducted.
2. Questions must be answered on OMR sheet by darkening the appropriate bubble marked A, B, C, or D.
3. Use only **Black/Blue ball point pen** to mark the answer by complete filling up of the respective bubbles.
4. Mark the answers only in the space provided. Do not make any stray mark on the OMR.
5. Write question booklet number and your roll number carefully in the specified locations of the **OMR**. Also fill appropriate bubbles.
6. Write your name (in block letter), name of the examination centre and put your full signature in appropriate boxes in the OMR.
7. The OMR 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, name of the examination centre. The OMR may also become invalid due to folding or putting stray marks on it or any damage to it. The consequence of such invalidation due to incorrect marking or careless handling by the candidate will be sole responsibility of candidate.
8. Candidates are not allowed to carry any written or printed material, calculator, pen, docu-pen, log table, wristwatch, any communication device like mobile phones etc. inside the examination hall. Any candidate found with such items will be **reported against** and his/her candidature will be summarily cancelled.
9. Rough work must be done on the question paper itself. Additional blank pages are given in the question paper for rough work.
10. Hand over the OMR to the invigilator before leaving the Examination Hall.
11. This paper contains questions in both English and Bengali. Necessary care and precaution were taken while framing the Bengali version. However, if any discrepancy(ies) is /are found between the two versions, the information provided in the English version will stand and will be treated as final.



English Language

1. Choose the word, which has nearly the same meaning as EXUDE.
(A) Drop (B) Ooze
(C) Overflow (D) Evaporate

2. Choose the word, which is opposite in meaning to IMPOUND.
(A) Compound (B) Generate
(C) Dollar (D) Release

3. Pick out the word that has either nearly the same meaning or opposite meaning to CANDID.
(A) Contact (B) Secretive
(C) Diagonal (D) Cancel

4. Choose the word that can replace both the words in italics in the two given sentences.
I. The stadium can *seat* more than one lakh people.
II. Sujan agreed to *adjust* his plan with mine.
(A) Hold (B) Accommodate
(C) Arrange (D) Participate

5. Observe the two italicized words in the following two sentences and give your observation by choosing any one option below.
I. A vote of *censur* was passed against the Chairman.
II. Every film needs a clearance from the *Censor* Board.
(A) Only sentence-I is correct.
(B) Only sentence-II is correct.
(C) Both sentences I and II are correct.
(D) Neither sentence-I nor sentence-II is correct.

PUBDET-2019

6. Choose the option, which can best replace the group of words given
To congratulate someone in a formal function
(A) felicitate (B) celebrate
(C) wish (D) solemnize
7. Choose the most effective word to fill in the blank to make the sentence meaningfully complete.
Some people _____ themselves into believing that they are indispensable to the organization they work for.
(A) force (B) delude
(C) keep (D) ask
8. Choose the most appropriate pair of words from the options given below to fill in the blanks in the given sentence in the same order to make the sentence meaningfully complete.
She was _____ because all her plans had gone _____.
(A) frustrated, magnificently (B) elated, wild
(C) dejected, splendidly (D) distraught, awry
9. Fill in the blank with the most appropriate word/ group of words to make the sentence meaningfully complete.
The horse stampeded and tore _____ the street.
(A) after (B) off
(C) down (D) out
10. Pick out the group of words, which completes the given sentence most meaningfully.
He is so poor _____.
(A) to buy meals daily (B) because buying meals
(C) that he cannot buy two meals a day (D) to get two meals a day
11. Find out which part of the sentence has an error.
There is still / little tea / and some biscuits / are left for you
(A) (B) (C) (D)

PUBDET-2019

12. Choose the most suitable phrase to replace the italicized part of the sentence given below.
He did not even talk to me, *leaving aside* staying here.
- (A) leave aside (B) leave beside
(C) leave besides (D) after leaving aside
13. Choose the most preferable sentence in respect to grammar, meaning and usage in order to express the intended theme.
- (A) It is not common to see an alligator basking in the sunshine on a river bank as long as twenty feet.
(B) It is not common to see an alligator as long as twenty feet basking in the sunshine on a river bank.
(C) It is not common to see an alligator basking in the sunshine as long as twenty feet on a river bank.
(D) It is not common to see an alligator basking as long as twenty feet in the sunshine on a river bank.
14. Arrange the four parts of sentences given below in best order to fill in the blanks in the given sentence to form a complete meaningful sentence.
The man whom I hit on the head _____ till I cry for mercy.
- (P) says that when he meets me
(Q) on my way back from school
(R) on the road
(S) he will beat me
- (A) QPRS (B) PQRS
(C) SPRQ (D) SRQP
15. A sentence is given in active (or passive) voice. Out of the four alternatives given select the one which best expresses the same sentence in passive (or active) voice.
I remember my father taking me to the zoo.
- (A) I remember taken to the zoo by my father.
(B) I remember being taken to the zoo by my father.
(C) I remember myself being taken to the zoo by my father.
(D) I remember I was taken to the zoo by my father.

16. The number of solution(s) of $\frac{\log 5 + \log(x^2 + 1)}{\log(x - 2)} = 2$ is

$$\frac{\log 5 + \log(x^2 + 1)}{\log(x - 2)} = 2 \text{ -এর সমাধান সংখ্যা হল}$$

- (A) 0 (B) 1
(C) 2 (D) 3
17. Number of divisors of 38808, [except 1 and the number] is
1ও 38808 বাদে 38808 -এর ভাজকের সংখ্যা হল
(A) 72 (B) 68
(C) 70 (D) 74
18. The number of all possible selections of one or more questions from 8 given questions, each question having an alternative, is
আটটি পদভ্র প্রশ্নের প্রতিটির একটি বিকল্প প্রশ্ন দেওয়া আছে। এক বা একাধিক প্রশ্নের উত্তরের সংখ্যা হল
(A) $2^8 - 1$ (B) $3^8 - 1$
(C) $4^8 - 1$ (D) $3^8 - 2$
19. For all $n \in \mathbb{N}$, $7^{2n} + 3^{n-1} \cdot 2^{3n-3}$ is divisible by
সকল $n \in \mathbb{N}$ -এর জন্য $7^{2n} + 3^{n-1} \cdot 2^{3n-3}$ যে সংখ্যা দ্বারা বিভাজ্য হবে তা হল
(A) 24 (B) 9
(C) 13 (D) 25
20. The sum of the coefficients of all the integral powers of x in the expansion of $(1 + 2\sqrt{x})^{40}$ is
 $(1 + 2\sqrt{x})^{40}$ -এর বিস্তৃতিতে x -এর পূর্ণসংখ্যা ঘাতের যোগফল হবে
(A) $3^{40} + 1$ (B) $3^{40} - 1$
(C) $\frac{1}{2}(3^{40} - 1)$ (D) $\frac{1}{2}(3^{40} + 1)$

21. If the 3rd term in the expansion of $(x + x^{\log_{10}x})^5$ is 10^6 , then x can be

$(x + x^{\log_{10}x})^5$ -এর বিস্তৃতিতে তৃতীয় পদ 10^6 হলে x হবে

- (A) 1 (B) $\sqrt{10}$
(C) 10 (D) 10^{-25}

22. If $A = \begin{bmatrix} 1 & 2 & -1 \\ -1 & 1 & 2 \\ 2 & -1 & 1 \end{bmatrix}$, then $\det(\text{Adj } A) =$

$A = \begin{bmatrix} 1 & 2 & -1 \\ -1 & 1 & 2 \\ 2 & -1 & 1 \end{bmatrix}$ হলে $\det(\text{Adj } A)$ হবে

- (A) 14 (B) $(14)^2$
(C) $(14)^3$ (D) $(14)^4$

23. For any two non - empty sets A and B , $(A - B) \cup (B - A)$ is equal to

যেকোন দুটি অ-শূন্য সেট A ও B -এর ক্ষেত্রে $(A - B) \cup (B - A)$ হবে

- (A) $A - (A \cap B)$ (B) $(A \cup B) - (A \cap B)$
(C) $B - (A \cap B)$ (D) ϕ

24. Which of the following is a bijective mapping on the set of real numbers ?

নিম্নলিখিত চিত্রণগুলির মধ্যে কোনটি $\mathbb{R} \rightarrow \mathbb{R}$ একৈক উপরিচিত্রণ হবে ?

- (A) $2x - 5$ (B) $|x|$
(C) x^2 (D) $x^2 + 1$

25. The equation $\begin{vmatrix} x & a & b \\ a & x & b \\ a & b & x \end{vmatrix} = 0$ holds for

$\begin{vmatrix} x & a & b \\ a & x & b \\ a & b & x \end{vmatrix} = 0$ সমীকরণটি সিদ্ধ হবে যখন

- (A) $a, b, -(a + b)$ (B) $a, -b, a + b$
(C) $-a, b, a + b$ (D) $-a, -b, -(a + b)$

26. Let $\Delta = \begin{vmatrix} 1 & a & a^2 & -bc \\ 1 & b & b^2 & -ac \\ 1 & c & c^2 & -ab \end{vmatrix}$, then

মনে কর $\Delta = \begin{vmatrix} 1 & a & a^2 & -bc \\ 1 & b & b^2 & -ac \\ 1 & c & c^2 & -ab \end{vmatrix}$, তবে

- (A) $\Delta = abc$ (B) $\Delta = 0$
 (C) $\Delta = a + b + c$ (D) $\Delta = a^3 + b^3 + c^3 - 3abc$

27. A, B are non-singular symmetric matrices of same order & A, B commute. Then

- (A) $A^{-1}B^{-1}$ is symmetric (B) $A^{-1}B^{-1}$ is skew symmetric
 (C) $A^{-1}B^{-1}$ is orthogonal (D) $A^{-1}B^{-1}$ is identity matrix

A ও B অবিশিষ্ট প্রতিসম ম্যাট্রিক্স ও উভয়ে একই ক্রমের এবং পরস্পর বিনিময় যোগ্য।
 সেক্ষেত্রে,

- (A) $A^{-1}B^{-1}$ প্রতিসম ম্যাট্রিক্স (B) $A^{-1}B^{-1}$ বিপ্রতিসম ম্যাট্রিক্স
 (C) $A^{-1}B^{-1}$ লম্ব ম্যাট্রিক্স (D) $A^{-1}B^{-1}$ একসম ম্যাট্রিক্স

28. Let $E = \begin{bmatrix} 3 & 1 \\ 1 & -1 \end{bmatrix}$, $A = \begin{bmatrix} 1 & 1 \\ 1 & 0 \end{bmatrix}$, $B = \begin{bmatrix} 0 & 0 \\ 1 & 1 \end{bmatrix}$, $C = \begin{bmatrix} 0 & 2 \\ 0 & -1 \end{bmatrix}$, Then $E =$

মনে কর $E = \begin{bmatrix} 3 & 1 \\ 1 & -1 \end{bmatrix}$, $A = \begin{bmatrix} 1 & 1 \\ 1 & 0 \end{bmatrix}$, $B = \begin{bmatrix} 0 & 0 \\ 1 & 1 \end{bmatrix}$, $C = \begin{bmatrix} 0 & 2 \\ 0 & -1 \end{bmatrix}$, তবে $E =$

- (A) $2A - B + C$ (B) $3A - 2B - C$
 (C) $2A - 5B + C$ (D) $3A + 2B - 2C$

29. On \mathbb{R} , a relation ρ is defined as follows :

If $a, b \in \mathbb{R}$, $a \rho b$ holds iff $a - b$ is zero or irrational. Then

- (A) ρ is only reflexive (B) ρ is only symmetric
 (C) ρ is equivalence relation (D) ρ is not equivalence relation

মনে কর $a, b \in \mathbb{R}$ -এর ক্ষেত্রে $a \rho b$ এভাবে সংজ্ঞাত যে $a - b = 0$ বা অমূলদ। সেক্ষেত্রে

- (A) ρ শুধুমাত্র স্বসম সম্পর্ক (B) ρ শুধুমাত্র প্রতিসম সম্পর্ক
 (C) ρ শুধুমাত্র সমতুল সম্পর্ক (D) ρ সমতুল সম্পর্ক নয়

30. Let $\Delta = \begin{bmatrix} 0 & c & b \\ c & 0 & a \\ b & a & 0 \end{bmatrix}^2$, Then

মনে কর $\Delta = \begin{bmatrix} 0 & c & b \\ c & 0 & a \\ b & a & 0 \end{bmatrix}^2$, তবে

(A) $\Delta = \begin{bmatrix} -a^2 & ab & ca \\ ab & -b^2 & bc \\ ac & bc & -c^2 \end{bmatrix}$

(B) $\Delta = \begin{bmatrix} -a^2 & -ab & -ca \\ -ab & +b^2 & -bc \\ -ac & -bc & -c^2 \end{bmatrix}$

(C) $\Delta = (a+b)(b+c)(c+a)$

(D) $\Delta = abc(a+b+c)$

31. A determinant is chosen at random from the set of all determinants of order 2 with elements 0 and 1 only. The probability that the value of the determinant chosen is positive, is

0 ও 1 উপাদান বিশিষ্ট দ্বিতীয় ক্রমের সকল নির্ণায়কের সেট থেকে একটি নির্ণায়ক যদুচ্ছভাবে বেছে নেওয়া হল। বেছে নেওয়া নির্ণায়কের মান ধনাত্মক হওয়ার সম্ভাবনা হল

(A) $\frac{1}{16}$

(B) $\frac{1}{8}$

(C) $\frac{3}{16}$

(D) $\frac{1}{4}$

32. If A and B are two mutually exclusive and exhaustive set of events, such that $P(B) = 2P(A)$, then $P(A) =$

A ও B দুটি পরস্পর বিচ্ছিন্ন ও পরস্পর নিঃশেষী ইভেন্ট (ঘটনা) এবং $P(B) = 2P(A)$ । সেক্ষেত্রে $P(A)$ হবে

(A) $\frac{1}{2}$

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

(C) $\frac{1}{3}$

(D) $\frac{3}{4}$

33. A circle of area 4π square units has two of its diameters along the lines $x + y = 2$ and $x - y = 4$. The equation of the circle is

৪π বর্গ ইউনিট ক্ষেত্রফল বিশিষ্ট একটি বৃত্তের দুটি ব্যাস $x + y = 2$ ও $x - y = 4$ বাহু বরাবর রয়েছে। সেক্ষেত্রে বৃত্তটির সমীকরণ হবে

- (A) $x^2 + y^2 + 6x + 2y + 6 = 0$ (B) $x^2 + y^2 - 6x - 2y - 6 = 0$
 (C) $x^2 + y^2 - 6x + 2y + 6 = 0$ (D) $x^2 + y^2 - 6x - 2y + 6 = 0$

34. If h denotes the arithmetic mean and k denotes the geometric mean of the intercepts made on the co-ordinate axes by the line passing through the point $(1, 1)$, then the point (h, k) lies on a

- (A) circle (B) parabola
 (C) straight line (D) hyperbola

$(1, 1)$ বিন্দুগামী সরলরেখার স্থানাঙ্কঅক্ষদ্বয় বরাবর ছেদিতাংশদ্বয়ের সমান্তরীয় মধ্যক h ও গুণোত্তরীয় মধ্যক k দ্বারা চিহ্নিত করা হলে (h, k) বিন্দুটি যে বক্রের উপরে অবস্থিত তা হল একটি

- (A) বৃত্ত (B) অধিবৃত্ত
 (C) সরলরেখা (D) পরাবৃত্ত

35. Given that $16h^2$ is the area of the triangle formed by the lines $y = x$, $x + y = 2$ and the line through $P(h, k)$ parallel to the x -axis. Then the locus of P is/are

$P(h, k)$ বিন্দুগামী ও x -অক্ষের সমান্তরাল একটি সরল রেখা এবং $y = x$ ও $x + y = 2$ বাহুদ্বয় বিশিষ্ট ত্রিভুজের ক্ষেত্রফল $16h^2$ হলে P -এর সঞ্চারণপথ হবে

- (A) $y - 1 = \pm 4x$ (B) $y - 1 = 3x$
 (C) $y - 1 = -5x$ (D) $y - 1 = \pm 2x$

36. A line passes through the point $(2, -2)$ and makes an angle $\cos^{-1} \frac{4}{5}$ in the positive direction of the x -axis. If the line meets the curve $y^2 = 3x - 17$ at A and B , then length $|AB|$ will be

একটি সরলরেখা $(2, -2)$ বিন্দুগামী এবং x -অক্ষের ধনাত্মক দিকের সঙ্গে $\cos^{-1} \frac{4}{5}$ কোণ উৎপন্ন করে। সরলরেখাটি $y^2 = 3x - 17$ বক্ররেখাকে A ও B বিন্দুতে ছেদ করে। তবে দৈর্ঘ্য $|AB|$ হবে

- (A) $\frac{10}{3}$ unit / একক (B) $\frac{5}{4}$ unit / একক
 (C) $\frac{6}{5}$ unit / একক (D) $\frac{3}{10}$ unit / একক

37. The domain of definition of $f(x) = \sqrt{\log \frac{4x-x^2}{3}}$ is

$f(x) = \sqrt{\log \frac{4x-x^2}{3}}$ -এর সংজ্ঞার অঞ্চল হবে

- (A) [1, 3] (B) (1, 3]
(C) [1, 3) (D) (1, 3)

38. $\lim_{x \rightarrow 0} \frac{(e^x - 1) \tan^2 x}{x^3}$

- (A) does not exist (B) is 1
(C) is 2 (D) is zero

$\lim_{x \rightarrow 0} \frac{(e^x - 1) \tan^2 x}{x^3}$ -এর

- (A) অস্তিত্ব নেই (B) মান হবে 1
(C) মান হবে 2 (D) মান হবে শূণ্য

39. Let $y = \frac{1}{1+x+\log x}$, then
মনে কর $y = \frac{1}{1+x+\log x}$ সেক্ষেত্রে

- (A) $x \frac{dy}{dx} + y = x$ (B) $x \frac{dy}{dx} = y(y \log x - 1)$
(C) $x^2 \frac{dy}{dx} = y^2 + 1 - x^2$ (D) $x \left(\frac{dy}{dx}\right)^2 = y - x$

40. The function $f(x) = \frac{\log x}{x} + \log 51$

- (A) increases for $x > e$ (B) decreases for $2 < x < e$
(C) decreases for $x > e$ (D) $f'(x) = 0$ for $x = 2e^3$

অপেক্ষক $f(x) = \frac{\log x}{x} + \log 51$

- (A) $x > e$ -এর জন্য ক্রমবর্ধমান হবে (B) $2 < x < e$ -এর ক্ষেত্রে ক্রমহ্রাসমান হবে
(C) $x > e$ -এর জন্য ক্রমহ্রাসমান হবে (D) $f'(x) = 0$ যখন $x = 2e^3$

41. If $\log y = \tan^{-1} x$ and $(1 + x^2) \frac{d^2y}{dx^2} + f(x) \frac{dy}{dx} = 0$, then $f(x) =$

$\log y = \tan^{-1} x$ ও $(1 + x^2) \frac{d^2y}{dx^2} + f(x) \frac{dy}{dx} = 0$, হলে $f(x) =$

- (A) $2x+1$ (B) $2x-1$
(C) $1-2x$ (D) 2

42. Let $f(x) = x^2 \log x$, x in $[1, e]$. Then

- (A) critical points exist in $[1, e]$
(B) no critical point exists inside the interval but least value is 0 and the greatest value is e^2
(C) there are four critical points in $[1, e]$
(D) finite number of critical points exist in $[1, e]$

মনে কর $f(x) = x^2 \log x$, $x \in [1, e]$ । সেক্ষেত্রে

- (A) $[1, e]$ -তে সন্ধিবিন্দু বিদ্যমান।
(B) অন্তরালের অভ্যন্তরে সন্ধিবিন্দুর অস্তিত্ব নেই কিন্তু সর্বনিম্ন মান 0 ও সর্বোচ্চ মান e^2 হবে
(C) $[1, e]$ -তে চারটি সন্ধিবিন্দু বিদ্যমান
(D) $[1, e]$ -তে সসীম সংখ্যক সন্ধিবিন্দু রয়েছে

43. Let $y = \frac{3x+2}{x^2-2x+5}$. Then

মনে কর $y = \frac{3x+2}{x^2-2x+5}$ । সেক্ষেত্রে

- (A) $5y_2(0) - 4y_1(0) + 2y(0) = 0$ (B) $2y_2(0) + 3y_1(0) - 4y(0) = 0$
(C) $y_2(0) + 2y_1(0) - 3y(0) = 0$ (D) $2y_2(0) + 5y_1(0) - 4y(0) = 0$

44. The function $f(x) = p[x+1] + q[x-1]$ where $[x]$ has its usual meaning, is continuous at $x = 1$ if

$f(x) = p[x+1] + q[x-1]$, যেখানে $[x]$ প্রচলিত অর্থবহ, $x = 1$ বিন্দুতে সন্তত হবে যদি

- (A) $p + q = 0$ (B) $p = q$
 (C) $p = 0$ (D) $q = 0$

45. If $x = 2 \cos \theta - \cos 2\theta$, $y = 2 \sin \theta + \sin 2\theta$, then $\frac{d^2y}{dx^2}$ at $\theta = \frac{\pi}{2}$ is

প্রদত্ত $x = 2 \cos \theta - \cos 2\theta$, $y = 2 \sin \theta + \sin 2\theta$, তবে $\theta = \frac{\pi}{2}$ হলে $\frac{d^2y}{dx^2}$ হবে

- (A) 2 (B) 3
 (C) $\frac{1}{2}$ (D) $\frac{1}{3}$

46. If $f(x) = a_0 \cos |x| + a_1 \sin |x| + a_2 |x|^3$ is differentiable at $x = 0$, then

- (A) $a_1 = 0, a_2 = 0$
 (B) $a_0 = 0, a_1 = 0$
 (C) $a_1 = 0$
 (D) a_0, a_1, a_2 can take any real value

যদি $x = 0$ বিন্দুতে $f(x) = a_0 \cos |x| + a_1 \sin |x| + a_2 |x|^3$ অবকলনযোগ্য হয় তবে

- (A) $a_1 = 0, a_2 = 0$
 (B) $a_0 = 0, a_1 = 0$
 (C) $a_1 = 0$
 (D) a_0, a_1, a_2 যে কোন বাস্তবমান পরিগ্রহ করবে

47. Given that the equation $a_0x^n + a_1x^{n-1} + \dots + a_{n-1}x = 0$ has a positive root x_0 . Then the equation $na_0x^{n-1} + (n-1)a_1x^{n-2} + \dots + a_{n-1} = 0$

(A) has no positive real root (B) must have a positive real root $> x_0$
 (C) has a positive real root $< x_0$ (D) has no real root

প্রদত্ত যে $a_0x^n + a_1x^{n-1} + \dots + a_{n-1}x = 0$ সমীকরণের একটি ধনাত্মক বীজ x_0 আছে। সেক্ষেত্রে $na_0x^{n-1} + (n-1)a_1x^{n-2} + \dots + a_{n-1} = 0$ সমীকরণের

(A) কোন ধনাত্মক বীজ নেই (B) অবশ্যই একটি ধনাত্মক বীজ $> x_0$ থাকবে
 (C) একটি ধনাত্মক বাস্তব বীজ $< x_0$ থাকবে (D) কোন বাস্তব বীজ থাকবে না

48. The period of the function $f(x) = \sin^4x + \cos^4x$ is

$f(x) = \sin^4x + \cos^4x$ অপেক্ষকের পর্যায় হবে

(A) 2π (B) π
 (C) $\pi/2$ (D) 3π

49. The differential equation of the family of curves $y = \frac{A}{x} + Bx^2$, (where A, B are arbitrary constants) is

$y = \frac{A}{x} + Bx^2$ (A ও B যদৃচ্ছ পূর্বক) বক্ররেখা পরিবারের অবকল সমীকরণ হবে

(A) $x^2 \frac{d^2y}{dx^2} = 2y$ (B) $x \frac{d^2y}{dx^2} = 2y^2$
 (C) $2y \frac{d^2y}{dx^2} = x^2$ (D) $2y^2 \frac{d^2y}{dx^2} = x$

50. If $\frac{dy}{dx} = y + 3 > 0$ and $y(0) = 2$, then $y(\log 2)$ is equal to

$\frac{dy}{dx} = y + 3 > 0$ ও $y(0) = 2$ হলে $y(\log 2)$ -এর মান হবে

(A) 13 (B) -2
 (C) 7 (D) 5

