

50002

QUESTION PAPER
SERIES CODE

A

Test Centre : _____

Roll No. : _____

Name of the Candidate : _____

S A U

Entrance Test for M.Phil./Ph.D. (Economics), 2016

[PROGRAMME CODE : PEC]

Question Paper

Time : 3 hours

Maximum Marks : 50

INSTRUCTIONS FOR CANDIDATES

Candidates must carefully read the following instructions before attempting the Question Paper :

- (i) Write your Name, Roll Number and Name of the Test Centre in the space provided for the purpose on the top of this Question Paper and on the OMR/Answer Sheet.
- (ii) This Question Paper has Two Sections : Section—A and Section—B.
- (iii) Section—A (Objective-type) has 25 questions of **one** mark each. All questions are compulsory.
- (iv) **A wrong answer will lead to the deduction of one-fourth ($\frac{1}{4}$) of the marks assigned to that question.**
- (v) Section—B has 10 Long-answer questions out of which 5 questions are to be answered. Each question carries **five** marks.
- (vi) **Please darken the appropriate circle of 'Question Paper Series Code' and 'Programme Code' on the OMR Sheet in the space provided.**
- (vii) Section—A (Multiple Choice) questions should be answered on the OMR Sheet and answers for Section—B should be written in the Answer Book.
- (viii) Answers written inside the Question Paper will **NOT** be evaluated.
- (ix) Calculators and Log Tables may be used. Mobile Phones are **NOT** allowed.
- (x) A page at the end of the Question Paper has been provided for Rough Work.
- (xi) **Return the Question Paper, the OMR Sheet and the Answer Book to the Invigilator at the end of the Entrance Test.**
- (xii) **DO NOT FOLD THE OMR SHEET.**

/8-A

INSTRUCTIONS FOR MARKING ANSWERS ON THE 'OMR SHEET'

Use BLUE/BLACK Ballpoint Pen Only

- Please ensure that you have darkened the appropriate circle of 'Question Paper Series Code' and 'Programme Code' on the OMR Sheet in the space provided.

Example :

Question Paper Series Code
Write Question Paper Series Code A or B in the box and darken appropriate circle.

	A or B
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●
Ⓐ

Programme Code
Write Programme Code in the box and darken the appropriate circle.

Write Programme Code					
MEC	<input type="radio"/>	MAM	<input type="radio"/>	PCS	<input type="radio"/>
MSO	<input type="radio"/>	MLS	<input type="radio"/>	PBT	<input type="radio"/>
MIR	<input type="radio"/>	PEC	<input checked="" type="radio"/>	PAM	<input type="radio"/>
MCS	<input type="radio"/>	PSO	<input type="radio"/>	PLS	<input type="radio"/>
MBT	<input type="radio"/>	PIR	<input type="radio"/>		

- Use only Blue/Black Ballpoint Pen to darken the Circle. Do not use Pencil to darken the Circle for Final Answer.
- Please darken the whole Circle. ●
- Darken ONLY ONE CIRCLE for each question as shown below in the example :

Example :

Wrong	Wrong	Wrong	Wrong	Correct
● (b) (c) ●	⊗ (b) (c) (d)	⊗ (b) (c) ⊗	⊙ (b) (c) ●	Ⓐ (b) (c) ●

- Once marked, no change in the answer is possible.
- Please do not make any stray marks on the OMR Sheet.
- Please do not do any rough work on the OMR Sheet.
- Mark your answer only in the appropriate circle against the number corresponding to the question.
- A wrong answer will lead to the deduction of one-fourth (¼) of the marks assigned to that question.**
- Write your six-digit Roll Number in the small boxes provided for the purpose; and also darken appropriate circle corresponding to respective digits of your Roll Number as shown in the example below.

Example :

ROLL NUMBER					
1	3	5	7	2	0
●	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ
Ⓐ	Ⓐ	Ⓐ	Ⓐ	●	Ⓐ
Ⓐ	●	Ⓐ	Ⓐ	Ⓐ	Ⓐ
Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ
Ⓐ	Ⓐ	●	Ⓐ	Ⓐ	Ⓐ
Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ
Ⓐ	Ⓐ	Ⓐ	●	Ⓐ	Ⓐ
Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ
Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ
Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	●

SECTION—A

Answer **all** questions

1. The headcount poverty rate based on a constant poverty line and calculated at the household level fell from 42 percent to 36 percent between 2000 and 2010 for a country. This implies that
 - (a) six percent of the total households in the country came out of poverty and no new household fell into poverty
 - (b) six percent of the poor households escaped poverty
 - (c) six percent of the total households in the country came out of poverty adjusting for the households that fell into poverty
 - (d) nothing definite about the household level poverty dynamics can be said from this information

2. According to Thomas Piketty's well-known recent work, *Capital in the Twenty-First Century*, the level of income inequality declined for a sustained period of time only
 - (a) before World War I
 - (b) between World War I and II
 - (c) between the Great Depression and 1970
 - (d) since 1980

3. Although microcredit is often targeted at the poor, the rate of interest charged in such loans is usually much higher than that charged by commercial banks. This is primarily because
 - (a) the microcredit business is more profit-oriented than the commercial banks
 - (b) the transaction cost per unit of loan is higher for microcredit loans
 - (c) in the absence of collateral, microcredit loans are more risky than bank loans
 - (d) Both (b) and (c)

4. Since 1970s, the tax-GDP ratio has undergone a major change across different countries in the world. Over this time, this ratio
 - (a) fell substantially for rich countries as well as poor countries
 - (b) rose for the rich countries but fell for the poor countries
 - (c) fell for the rich countries but rose for the poor countries
 - (d) does not show any systematic trend for the rich or the poor countries

5. According to the Big Push theory of economic development, private investments may be inadequate for large-scale industrialization due to
- complementarities in investment decisions
 - existence of multiple equilibria
 - increasing returns to scale
 - All of the above

To answer questions numbered 6-8, please refer to the following information :

Suppose the production function takes the following form :

$$Y(t) = K(t)^\alpha [A(t)L(t)]^{1-\alpha}, \quad 0 < \alpha < 1$$

where K is capital stock and AL is effective labour. Parameters used in the models are s, n, δ, g and α which represent the savings rate, population growth rate, depreciation rate of capital, growth rate of technology and share of capital in output respectively. Given all the assumptions of the Solow model,

6. The steady-state values of capital per unit of effective labour (k) will be
- $[s / (n + g + \delta)]^{1/(1-\alpha)}$
 - $sk^\alpha - (n + g + \delta)k$
 - $(s)^{1/(1-\alpha)}$
 - None of the above
7. The golden rule level of capital per unit of effective labour (k) will be
- $s - (n + g + \delta)$
 - $[\alpha / (n + g + \delta)]^{1/(1-\alpha)}$
 - $(s)^{1/(1-\alpha)}$
 - α
8. The savings rate required to yield golden rule level of capital per unit of effective labour is
- s
 - α
 - $1 - \alpha$
 - $(s)^{1/(1-\alpha)}$
9. Even though insider trading is illegal in most countries, inside information about a stock has often influenced its prices. This goes
- against the strong form of efficient market hypothesis
 - in favour of the strong form of efficient market hypothesis
 - against the semi-strong form of efficient market hypothesis
 - in favour of semi-strong form of efficient market hypothesis

10. Suppose the following bilateral spot exchange rates are being quoted for the Afghan Afghani (AFN), Bangladeshi Taka (BDT) and Maldivian Rufiyaa (MVR) :

$$\text{BDT/MVR} = 5.26$$

$$\text{AFN/MVR} = 4.54$$

$$\text{AFN/BDT} = 0.88$$

If you start with 100 MVR, the most you could end up with (in MVR) in a single round of trilateral arbitrage would be

- (a) 93.33
(b) 98.08
(c) 101.96
(d) 102.67
11. Mr. X's wealth next year, including his factory, is expected to be ₹ 6,00,000. There is a 20 percent chance that an accident in the factory, valued at ₹3,00,000, will completely damage it next year. Mr. X's expected wealth next year, if he does not purchase hazard insurance for his factory, is
- (a) ₹ 6,00,000
(b) ₹ 5,20,000
(c) ₹ 5,40,000
(d) None of the above
12. Consider a competitive industry where the market demand is given by $P = 50 - Q$. The marginal cost function is simply $MC = Q$. If the government imposes a tax of ₹ 10 per unit of production of this good, the equilibrium market price will go up by
- (a) zero
(b) ₹ 10
(c) ₹ 20
(d) ₹ 5

13. The production function of a monopolist firm is given by

$$Q = 10L - 0.5L^2$$

where L is labour input and Q is output. Suppose that the demand curve is $P(Q) = 50 - 0.5Q$. What is the marginal revenue product of labour curve?

- (a) $500 + 150L - 15L^2$
(b) $500 - 150L + 15L^2 - 0.5L^3$
(c) $50 - Q$
(d) None of the above

14. Two kinds of consumers exist for product Z in a market—one kind of consumer has an intense liking for the product, with an inverse demand curve of $P = 20 - Q$, where P is the price of Z and Q is the quantity of Z . The other type of consumer has a less intense liking for the product and has an inverse demand curve of $P = 5 - (1/2)^* Q$. If there are only two consumers in the market, one of each type, the market demand curve for Z will be
- $Q = p$ for all price levels p
 - $Q = 30 - 3P$ for all price levels $p > 5$ and $Q = 20 - P$ for $p \leq 5$
 - $Q = 15 - 3P$ for all price levels $p \leq 5$ and $Q = 20 - P$ for $p > 5$
 - $Q = 30 - 3P$ for all price levels $p \leq 5$ and $Q = 20 - P$ for $p > 5$
15. Consider an environment where an individual faces $(p_1, p_2) = (1, 1)$. At these prices, she is maximising her utility at $(x_1, x_2) = (7, 7)$. If the price changes to $(1, 2)$, the consumer will be
- as well off as before
 - worse off
 - better off if she was a net buyer of good-1 and remained a net buyer after the price change
 - None of the above
16. Suppose that two persons make an appointment to meet between 5 p.m. and 6 p.m. at a certain location, and they agree that neither person will wait more than 10 minutes for the other person. If they arrive independently at random times between 5 p.m. and 6 p.m., the probability that they will meet is
- $5/36$
 - $1/6$
 - $2/21$
 - $11/36$
17. Suppose that a point is chosen at random on a stick of unit length and that the stick is broken into two pieces at that point. The expected value of the length of the longer piece will be
- $2/3$
 - $3/4$
 - $1/2$
 - $4/5$

18. Which one of the following statements is true?
- (a) Under the presence of heteroskedasticity, the usual F statistic no longer has an F distribution.
 - (b) Consistency of OLS estimation requires $\text{cov}(x, u) = 0$.
 - (c) The Breusch-Pagan LM test is used to detect the presence of heteroskedasticity.
 - (d) All of the above
19. If a random variable X has a cumulative distribution function $F(x)$, which one of the following statements will be true?
- (a) $F(x)$ is right-continuous in x .
 - (b) $F(x)$ is non-decreasing in x .
 - (c) $F(x)$ takes values in the $[0, 1]$ interval.
 - (d) All of the above
20. Consistent estimation of the slope parameter (denoted by α) under OLS requires
- (a) $\text{plim}(\hat{\alpha}) = \alpha$
 - (b) $E(\hat{\alpha}) = \alpha$
 - (c) $E(\hat{\alpha}|X) = \alpha$
 - (d) All of the above
21. The eigen roots of the matrix $A = \begin{pmatrix} 3 & 4 \\ 2 & 1 \end{pmatrix}$ are
- (a) 1 and 5
 - (b) 1 and -5
 - (c) 1 and 6
 - (d) -1 and 5

22. Consider the following system of equations :

$$\begin{aligned}x_1 + x_3 &= 3 \\x_1 - x_2 - x_3 &= 1 \\-x_1 + x_2 &= 4\end{aligned}$$

The above system of linear equations is

- (a) inconsistent
 - (b) consistent with infinitely many solutions
 - (c) consistent with a unique solution
 - (d) None of the above
23. If the feasible set of an optimization problem is unbounded, then
- (a) no finite optimum point exists
 - (b) it has infinite number of feasible points
 - (c) the existence of a finite optimum point cannot be assured
 - (d) All of the above
24. Which one of the following functions is convex in the range $0 < x < \infty$?
- (a) $y = x^2$
 - (b) $y = -x^2$
 - (c) $y = -x^3$
 - (d) $y = \sqrt{x}$
25. For the function $y = (x - 3)^3(x + 1)^2$, the point of inflection occurs at
- (a) $x = 3$
 - (b) $x = -1$
 - (c) $x = 1$
 - (d) $x = 3/5$

SECTION—B

Answer *any five* questions

26. Critically discuss the proximate causes of divergence in per capita income between the rich and the poor countries in the world as analyzed in the recent literature in development economics.
27. Evaluate the statement :
Green growth is the answer to the potential contradiction between growth and environmental sustainability.
28. How does the delegation of monetary policy to a conservative central banker help in overcoming the dynamic inconsistency problem?
29. Consider an economy with uncertainty over states of nature. All contracts on various assets are traded before the state of nature is revealed, but they are executed only after the state of nature is revealed. Agents face uncertainties arising from two distinct kinds of shocks—an aggregate shock affecting everyone symmetrically and an idiosyncratic shock affecting each agent differently. Prior to being hit by an idiosyncratic shock, each agent is identical *ex ante*.
Keeping the above facts in mind, show the existence of a positive risk premium in complete markets. Why, under complete markets, does the risk premium depend only on aggregate risk and not on idiosyncratic risk?
30. Three firms *A*, *B* and *C* are competing over prices in a homogeneous good product market (Bertrand price competition), with marginal costs $c_A > c_B > c_C$. What will be the equilibrium configuration in the market? Discuss how you derive your result.
31. Suppose that two strategies are available to each of the two competitors—to cooperate, *C*, or not to cooperate, *N*. The payoff matrix is given as follows :

Payoff Matrix for Firm—1

		<i>Firm—1's Strategy</i>	
		<i>C</i>	<i>N</i>
<i>Firm—2's Strategy</i>	<i>C</i>	450	506.5
	<i>N</i>	337.5	400

Payoff Matrix for Firm—2

		<i>Firm—1's Strategy</i>	
		<i>C</i>	<i>N</i>
<i>Firm—2's Strategy</i>	<i>C</i>	450	337.5
	<i>N</i>	506.5	400

- (a) Does this game have a Nash equilibrium? Is this equilibrium also in dominant strategies? Explain fully.
- (b) Can they improve upon their mutual benefit by deviating from the equilibrium? Explain.

32. Consider the following population regression function :

$$y^* = \beta_0 + \beta_1 x^* + u$$

Instead of y^* and x^* , we measure

$$y = y^* + w \text{ and } x = x^* + v$$

where w and v are measurement errors. Suppose we make the following assumptions :

$$E(w) = E(v) = 0$$

$$\text{var}(w) = \sigma_w^2 \quad \text{var}(v) = \sigma_v^2$$

$$\text{cov}(w, y^*) = \text{cov}(v, x^*) = \text{cov}(w, x^*) = \text{cov}(v, y^*) = 0$$

Can we obtain an unbiased estimator of β_1 ? If not, which one of the basic OLS assumptions is violated? Derive the expression for the potential bias.

33. Suppose we are given a simple panel data regression model

$$y_{it} = \mu_i + \lambda x_{it} + \varepsilon_{it}$$

where μ_i is the time-constant unobserved effect and ε_{it} is the idiosyncratic error. Briefly explain the crucial assumption on μ_i that allows us to distinguish between fixed-effects and random-effects methods of estimation. Is this assumption testable?

34. Determine which of the following statements are true and which are false. Justify your answer :

(a) If λ is an eigenvalue of A , then λ must be an eigenvalue of A^2 .

(b) An example of a linear combination of vectors v_1 and v_2 is the vector $\frac{1}{2}v^1$.

(c) Let A and B be $n \times n$ matrices. Assume that $AB = I_n$. Then $BA = I_n$.

(d) A union of two open sets can be closed.

35. In a Stackelberg game, there are two firms competing over quantities, the difference being that one firm is allowed to produce first and therefore, has a first-mover advantage. Assume that the inverse market demand is given by the linear equation $P = a - bQ$, where $Q = q_1 + q_2$ and where the index $i = 1, 2$ denotes the two firms. Furthermore, assume that costs for both firms are identical with marginal costs being constant and equal to c . Find the second firm's optimal output as a function of the parameters of the model. Given this optimal output, state the first-mover's optimization problem and find the solution.