

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI**SECOND SEMESTER 2022-2023****Mid – Semester Test (Closed Book)**

Course No. : **ECON F341**
 Course Title : **PUBLIC FIN THEO & POLICY**
 Date : **13/03/2023**

Max. Marks : **60.00**
 Duration : **90 mints**
 Weightage : **30%**

Instructions:

- All the questions are compulsory. Overwritten/ambiguous answers will not be evaluated.
- Exchange of calculators is not permitted inside the examination hall. Please mark the correct answer of the Part-A Questions.
- Show the necessary calculations wherever required. Please use a pen only while answering the question and drawing the graphs.
- All parts of the questions should be answered sequentially and together.
- To answer the Part A questions, draw a similar kind of table in the answer sheet and answer it accordingly in the sheet in terms of capital letters such as A, B, C or D in the first page of the answer sheet.

Part-A					
Q-1	Q-2	Q-3	Q-4	Q-5	Q-6

PART – A (06 Marks)

- Q1) Without government intervention, it is _____ true that _____ in equilibrium.
- always; private marginal benefit equals private marginal cost
 - sometimes; private marginal benefit equals private marginal cost
 - always; private costs equal private benefits
 - always; social marginal benefit equals social marginal cost
- Q2) If government provision of a public good results in an equal reduction in the provision of the good by market forces, then:
- private provision is partially crowded out.
 - private provision is not crowded out.
 - the warm glow effect caused an increase in the net amount of the public good.
 - private provision is fully crowded out.
- Q3) Ashish's health insurance policy has a deductible of ₹ 1,000, a ₹ 10 copayment on doctor visits, and coinsurance of 10% on all expenses other than those for which there are copayments. If Ashish went to the doctor four times (doctor's fee is ₹ 40 per visit) and had a surgery that cost ₹ 2,000, how much of these expenses did Ashish pay directly?
- ₹ 40
 - ₹ 1,000
 - ₹ 1,040
 - ₹ 1,140
- Q4) Adarsh's utility function is $U = \ln(C)$, where C is consumption. He earns ₹ 45,000 per year and races stock cars in his spare time. There's a 10% chance that he will crash on the racetrack in the next 12 months and incur medical costs of ₹ 15,000. He will also have to miss work and will lose about ₹ 5,000 in earnings. What is his expected utility?
- $0.90 \times \ln(45,000) + 0.10 \times \ln(25,000) = 10.66$
 - $45,000 - 15,000 - 5,000 = 25,000$
 - $\ln(45,000) + \ln(25,000) = 20.84$
 - $(0.90 \times 45,000) + (0.10 \times 25,000) = 43,000$
- Q5) The Tiebout model implies that _____ should be financed at the local level and that _____ should be financed at the state and federal levels.
- garbage collection; music programs
 - street sweeping; national defense programs
 - road repair; music programs
 - national defense; Garbage collection

- Q6) To what does the property of the independence of irrelevant alternatives refer?
- If voters for one choice feel more strongly than do voters for another choice, then the aggregation mechanism must be such that the choices are weighted accordingly.
 - If one choice is preferred by all voters, then the aggregation mechanism must be such that this choice is made by society.
 - If choice A is preferred to choice B and choice B is preferred to choice C, then A must be preferred to C.
 - Choices must satisfy the condition that if one choice is preferred to another, then the introduction of a third choice will not change that ranking.

PART – B (54 Marks)

Q7) What is Arrow's Impossibility Theorem? Highlight and explain the major axioms of this Theorem. Prove the Mathematical representation of Arrow's Impossibility Theorem given by Prof. Amartya Sen in his analysis of the impossibility of Paretian liberals. [15M]

Q8) Suppose that the (external) damage done by pollution is known to be $MD = 300 + 5Q$, and the (private) cost and benefit are given by $MC = 100 + 2Q$ and $MB = D_0 - 2Q$, where D_0 is not precisely known. [8M]

- If $D_0 = 1,000$, what would be the optimal quantity? What tax would be necessary in order for that to be the equilibrium quantity?
- Suppose that, based on the result from part (a), a cap-and-trade system is imposed to allow the optimal quantity of pollution to be produced. If $D_0 = 900$, what would be the deadweight loss associated with having the wrong quantity?

Q9) Critically analyse Wagner's Law of increasing state activities and present it graphically. Explain how this is further evaluated by Peacock and Wiseman's Hypothesis through three different effects. [10M]

Q10) Suppose Anand and Dave live by themselves far away from others. They choose between consuming a private good, X, with a price of ₹ 1 ($P_X = 1$), and a public good, fireworks, with a price of ₹ 1 ($P_F = 1$). They each have an income of ₹ 100. Because fireworks are a public good, the total amount provided is the sum of the amount provided by each individual: $F = F_A + F_D$. Each individual (i) has a utility function of the form:

$$U = 2 * \log(X_i) + \log(F_A + F_D) \quad [12M]$$

which he maximizes subject to the budget constraint:

$$X_i + F_i = 100$$

- Given this information, identify the total supply of fireworks without government intervention through the Nash equilibrium analysis.
- Identify whether part (a) estimates differ compared to the socially optimal level of provision of fireworks? Explain whether the public good is underprovided by the private market or not.
- Suppose now that Anand has an income of ₹ 125, while Dave has an income of only ₹ 75. Estimate the total supply of fireworks in this scenario. Do you think having one actor with a higher income leads the outcome to be closer to the social optimum?

Q11) Detailed information for a lumpy project with a fixed budget has been given in Table-i. Suppose that we have ₹ 700,000 to spend, say, on alternative highway projects, and that we may choose among projects A to G. Given this information and using the 3 decision rules of the cost-benefit analysis, explain which projects must be undertaken under each specific rule. Also, identify the total net benefit in each scenario, how much will remain unspent, and it will be optimally utilized. [9M]

Project choice with lumpy projects and fixed budget (₹ 000')							
Projects	A	B	C	D	E	F	G
Cost	200	145	80	50	300	305	125
Benefit	400	175	104	125	420	330	100