

**UNIVERSITY OF COLOMBO**  
**FACULTY OF ARTS**

THIRD YEAR EXAMINATION IN ARTS (ECONOMICS) -2018  
END OF THE SECOND SEMESTER

**ECN 3282 - TRANSPORT ECONOMICS AND POLICY ANALYSIS**

TIME ALLOWED: TWO (2) HOURS

**PART - I**

**Question No. 01 in this Part is compulsory**

**Question No. 01 [40 Marks] – This question is compulsory**

XYZ Depot has 175 buses in its fleet. In average, only 52% of the fleet is operational every day. The Average Vehicle Utilization has been recorded as 176 km per bus per day. The depot management has submitted the following information pertaining to the operations during the month of November 2018, and has specifically mentioned that the depot has reported “profits” during the month.

The depot management has proposed an incentive scheme which would pay 10% of the way bill revenue to bus crews to incentivize them, and expects to realise a 20% increase of the way-bill revenue. The management also has found that the depot can reduce its fuel cost by Rs. 1.00 per kilometer owing to the recent reduction of fuel prices.

<b>Revenues</b>	<b>Rs.</b>
Total Waybill Revenue	Rs. 19,584,576
Seasons Tickets Sales	Rs. 763872.20
Season Tickets Reimbursement	Rs. 75,958.80
Gamisariya	Rs. 129,451
Sisu Sariya	Rs. 181,231.40
Nisi Sariya	Rs. 19,527.20
Miscellaneous Revenue	Rs. 63,980
Tyre Purchase Assistance	Rs. 30,025
Salary Increase Subsidies	Rs. 3,136,910
Other assistance for salaries	Rs. 50,856
EPF Assistance	Rs. 54,500
Travel Passes Reimbursement	Rs. 763,008.40
Gratuity Assistance	Rs. 594,885
Special Hires	Rs. 693,529.20
Army Hires	Rs. 323,400

<b>Costs</b>	<b>Rs.</b>
Fuel	Rs. 9,717,195.60
Oil & Lubricants	Rs. 392,344.40
Bus Crew Incentives	Rs. 1,286,782
Garage Worker Incentives	Rs. 65,028.60
Batteries	Rs. 162,415.40
Other Direct Variable Cost	Rs. 2,931,849.20
Salaries	Rs. 10,856,889.40
Overtime	Rs. 1,618,555.40
Gratuity	Rs. 283,183.60
Recurrent Expenditures	Rs. 479,270.40

<b>Other Information</b>	
Bus Fare per Passenger Km	Rs. 5.00
Average Carrying Capacity	40psgrs/Bus
Time Table Requirement	124

You are required to

- (a) Work out the parameters and indices you may think appropriate and carry out a performance analysis of the XYZ Depot. [12 Marks]
- (b) Examine whether the statement that the XYZ Depot has earned "profits" during November 2018 is a justifiable claim. Substantiate your answer by working out the Profit and Loss Statement of the Depot for the month of November 2018. [10 Marks]
- (c) Discuss the areas in which you think the Depot has not performed successfully. Substantiate your answer by bringing in the relevant calculations. [10 Marks]
- (d) How do you think the Depot performance could be improved, while specifically examining the proposals made by the Depot management for this purpose. [8 Marks]

### **PART - II**

**Answer any one (01) question from this Part**

#### **Question No. 2 [20 Marks]**

The City-liner bus service operates from Moratuwa to Colombo, located 20 km apart, and its buses travel at an average speed of 30 km/hr. Passengers can travel either by the City-liner bus service or by their private cars. The same distance can be travelled in 20 minutes by car, which would involve a financial cost of Rs 240 per one-way journey for an average traveler.

- a.) A passenger, opting to travel by the City-liner bus, instead of travelling by his own car, finds that his generalized cost (GC) of using this bus service is Rs. 280 per one-way journey. Estimate the minimum Value of Time (VoT) this passenger should be having, if he opts to use the City-liner bus service, instead of travelling by car. [5 Marks]
- b.) It is assumed that the travel time and the bus fare are the only significant determinants of the passenger demand for the City-liner bus service. The average passenger demand ( $Q_d$ ) at the above stated generalized cost is 4000. The Quantity demanded is expected to change as a function of GC, where an increase of GC by one percentage point is expected to result in 0.7 percentage point reduction of the quantity demanded. If the Generalized Cost (GC) is the only determinant of the passenger demand ( $Q_d$ ), estimate the demand function of the City-liner bus service. [7 Marks]
- c.) Critically examine the importance and policy relevance of introducing such value-added premium bus service in Sri Lanka as a Park-and-Ride option for car users. [8 Marks]

**Question No. 3 [20 Marks]**

An aircraft arriving at the airport is needing repairs, before departure. The following activities, and their sequencing, have been identified as necessary.

Activity A : Taking to hanger and preparing for repair (3 hours)

Activity B : Removal of defective parts (2 hours)

Activity C : Repairing of the defective parts and re-fixing them (5 hours)

Activity D : Painting the aircraft body (2 hours)

Activity E : Loading supplies, and issuing the readiness notice for passenger check-in (1 hour)

Activity F : Cleaning the interior (2 hours)

Activity G : Passenger check-in and ground handling (4 hours)

Activity H : Taking the aircraft back to terminal, and passenger boarding (3 hours)

Activity A is a pre-requisite for starting activities B and C. Activity B has to be completed before commencing Activity D. Both activities E and F needs, before their commencement, the completion of Activity C. Activity G cannot start before the completion of both the activities D and E. Activities F and G have to be completed before getting on with the Activity H, and the plane can be departed only after the completion of the Activity H.

You are required to:

- (a) Prepare the Precedence diagram. Mark activities, their durations, and status nodes from arrival node to the departure node [7 Marks]
- (b) Work out the floats associated with each and every activity; and recommend to the airport manager as to the most critical set of activities on which the airport management has to pay careful attention so that the plane could depart as early as possible. [9 Marks]
- (c) What is the minimum duration it would take for the aircraft to depart, from the time of its arrival at the airport, if the airport management ensures the programme of activities as scheduled ? [4 Marks]

**PART - III**

**Answer any two (02) questions from this Part**

**Question No. 4 [20 Marks]**

- (a) Why do you think it is inappropriate to depend on the market mechanism to determine public transport fares? [6 Marks]
- (b) Prove mathematically or graphically that the "Marginal Cost Pricing" of transport supply will lead to welfare maximization [6 Marks]
- (c) "Average cost pricing is the best pricing strategy in any transport undertaking as it always guarantees the absence of loses to the supplier". Critically examine this statement using your own examples drawn from the Sri Lankan transport industry. [8 Marks]

**Question No. 5 [20 Marks]**

- (a) Explain the concepts of “Mobility” and “Accessibility”, using your own examples drawn from the transport sector. [4 Marks]
- (b) What are the most important issues you identify in the present day transport sector in Sri Lanka ? Develop your answer from the angles of institutions, regulations, infrastructure and service quality. [8 Marks]
- (c) What policy level interventions you think the government should pursue in order to effectively provide passenger mobility needs in Sri Lanka? [8 Marks]

**Question No. 6 [20 Marks]**

“The transport sector has become a major contributor to emission, congestion, pollution, etc, and the worldwide concern of these issues has led countries to take actions to reduce negative externalities associated with transportation”.

- a) Using Cowie’s Economic Model for pollution, explain the economic impacts of pollution caused by the transport sector. [5 Marks]
- b) Discuss how marketable pollution permits could help in reducing pollution caused by the transport sector. [5 Marks]
- c) As a Transport Economist, examine the strategies you may suggest in view of reducing negative transport externalities. Justify your answer. [10 Marks]

**Question No. 7 [20 Marks]**

- (a) “Sri Lanka has the potential to emerge as a regional maritime hub even though she is confronted with many challenges.” Examine the prevailing opportunities and challenges Sri Lanka is facing in looking forward to realizing the maritime hub status. [10 Marks]
- (b) Do you think that Sri Lanka’s Port and Shipping sector developments in the recent past have been well founded on a strategic policy framework? Substantiate your answer by discussing your own examples. [10 Marks]

**Question No. 8 [20 Marks]**

- (a) Identify the present strengths and opportunities which would possibly enable Sri Lanka to develop as a regional “Aviation Hub”. [6 Marks]
- (b) Sri Lanka’s recent efforts to develop a second international airport has been subject to wide criticism. Examine why you agree or disagree with the necessity to have a second international airport for Sri Lanka. Given that we have a second international airport now, what strategies could you suggest for the Government to adopt with regard to this airport? [14 Marks]