Answer to PTP_Intermediate_Syllabus 2012_Jun2014_Set 3

Paper 9 - Operations Management & Information Systems

Time allowed-3hrs **Full Marks: 100**

Section –A (60 Marks)
(Operations Management)
Answer Question No. 1 (carrying 12 marks) which is compulsory and answer any four (carrying 12 marks each) from the rest in this Section.

Working Notes should form part of the answer.

1.(a) The demand for sewing machine was estimated as 1000 per month for 5 months. Later on the actual demand was found as 900, 1050, 1000, 1100 and 950 respectively. Workout Bias. [2]

(b) A workshop operates on 2 shifts of 8 hours per day. It has 10 machines. It works for 5 days in a week. Machine utilization is 90% and the efficiency of the machines is 85%. Calculate the rated capacity of the workshop in standard hours. [2]

(c) Define Critical Path. [2]

(d) What does the word KAIZEN mean? [2]

(e) When Corrective Maintenance occurs? [2]

(f) A manufacturing company has a product line consisting of four work stations in series. The individual workstation capacities are given. The actual output of the line is 500 units per shift.
Calculate Efficiency of the production line

Workstation No.	A	B	C	D
Capacity / Shift	600	650	650	550

[2]

Answer:

1. (a) $\text{Bias} = \frac{(1000-900)+(1000-1050)+(1000-1000)+(1000-1100)+(1000-950)}{5}$

$= \frac{100-50+0-100+50}{5}$

= 0 units of sewing machines.

(b) Rated capacity of the workshop = No. of Shifts x No. of hour's in each shift x No. of days / week x No. of Machines x Utilization factor x Efficiency
= 2 x 8 x 5 x 10 x 0.90 x 0.85
= 612 Standard hour per week

(c) A critical path is a chain of sequential activities beginning with the project start and ending with its completion. So, the path through the network that has the longest expected completion time and is expected to determine the completion date of the project is called the critical path.

(d) KAI means change and ZEN means better. Thus KAIZEN means change for the better. It implies continuous improvement done consistently.

(e) As the name suggests, corrective maintenance occurs when there is a work stoppage because of machine breakdown. In this sense, maintenance becomes repair work. Repairs are made after the equipment is out of order – an electric motor will not start, a conveyor belt is ripped, or a shift has broken. In cases such as these, the maintenance department checks into the difficulty and makes the necessary repairs.

(f) The capacity of the system is decided by the workstation with minimum capacity / shift, i.e., the bottleneck. In the given example, the work station 'D' is having a capacity of 550 units / shift which is a minimum.
So the system capacity = 550 units / shift.
The actual output of the line = 500 units/shift.
Therefore, the system efficiency = $\frac{\text{Actual capacity}}{\text{System capacity}} \times 100 = \frac{500}{550} \times 100 = 90.91\%$.

2. (a) A manufacturing enterprise has introduced a bonus system of wage payment on a slab-rate based on cost of production towards labour and overheads.
The slab-rate being

Between 1% - 10%	**Saving in production cost**	**5% of saving**
Between 11% - 20%	**Saving in production cost**	**15%**
Between 21% - 40%	**Saving in production cost**	**30%**
Between 41% - 70%	**Saving in production cost**	**40%**
Above 70%	**Saving in production cost**	**50%**

The rate per hour for three workers A, B, C are ₹5 , ₹5.50 and ₹5.25 respectively. The overhead recovery rate is 500% of production wages and the material cost is ₹40 per unit. The standard cost of production per unit is determined at ₹160 per unit.
If the time taken by A,B,C to finish 10 units is 26 hours, 30 hours and 16 hours respectively, what is the amount of bonus earned by the individual workers and actual cost of production per unit? [6]

b) An industrial engineer deputed to conduct a time study for job,has after observation, divided the job into 5 elements. He had noted the timings for four cycles of the job as below:

	Time in minutes				
Element	**Cycle 1**	**Cycle 2**	**Cycle 3**	**Cycle 4**	**Performance rating (%)**
1	**1.246**	**1.328**	**1.298**	**1.306**	**90%**
2	**0.972**	**0.895**	**0.798**	**0.919**	**100%**
3	**0.914**	**1.875**	**1.964**	**1.972**	**100%**
4	**2.121**	**2.198**	**2.146**	**2.421**	**110%**
5	**1.253**	**1.175**	**1.413**	**2.218**	**100%**

(i) Are there any outliers in the data i.e. probable errors in reading or recording data which should not be included in the analysis?
(ii) Compute the basic time for the job and the standard time if a relaxation allowance of 12%, a contingency allowance of 3% and an incentive of 20% are applicable for the job. [1+5]

Answer:

2. (a)

Particulars	A	B	C

Unit produced	10	10	10
Wage rate/hr.	5.00	5.50	5.25
Time taken	26 hours	30 hours	16 hours
Wage payable	130.00	165.00	84.00
Overhead recovery	650.00	825.00	420.00
Materials	400.00	400.00	400.00
Total cost of production	1,180.00	1,390.00	904.00
Standard cost of production	1,600.00	1,600.00	1,600.00
Saving in cost of production	420.00	210.00	696.00
% of savings	26.25%	13.13%	43.50%
Bonus slab	30%	15%	40%
Bonus Amount	126.00	31.50	278.40
Actual cost of production	1,306.00	1,421.50	1,182.40
Cost / unit (₹)	130.60	142.15	118.24

(b) (i) The times for element No. 3 in cycle 1 and for element No. 5 in cycle 4 are suspected and should be disregarded as they vary very much as compared with time values for these elements in other cycles.

(ii) The basic time or normal time is calculated on the basis of data excluding the outliers as below:

Element	Mean actual time (Minutes)	Performance rating (%)	Normal or basic time (minutes)
1	$1.295 = \frac{1.246+1.328+1.298+1.306}{4}$	90	$\frac{1.295 \times 90}{100} = 1.166$
2	$0.896 = \frac{0.972+0.895+0.798+0.919}{4}$	100	$\frac{0.896 \times 100}{100} = 0.896$
3	$1.937 = \frac{1.875+1.964+1.972}{3}$	100	$\frac{1.937 \times 100}{100} = 1.937$
4	$2.222 = \frac{2.121+2.198+2.146+2.421}{4}$	110	$\frac{2.222 \times 110}{100} = 2.444$
5	$1.280 = \frac{1.253+1.175+1.413}{3}$	100	$\frac{1.280 \times 100}{100} = 1.280$

Normal time for the total job which include all five elements = 7.723 minutes
Calculation of standard time
Standard time for the job = Normal time + Allowances

$= 7.723 + \frac{12}{100} \times 7.723 + \frac{3}{100} \times 7.723$

= 7.723 + 0.927 + 0.231 = 8.881 minutes

If 20% incentive allowance is given, total time allowed under incentive scheme

$= 8.881 + \frac{20}{100} \times 8.881$

$= 8.881 + 1.776 = 10.657$ minutes

3. (a) Write a short note on Value Engineering. [4]

(b) Details of four stores are given in the following table:

	Store 1	Store 2	Store 3	Store 4	Total Supplies
Source 1	**48**	**60**	**56**	**58**	**14**
Source 2	**45**	**55**	**53**	**60**	**26**
Source 3	**50**	**65**	**60**	**62**	**36**
Total Demand	**20**	**32**	**25**	**21**	

Find the initial solution by least cost method. Is the initial solution feasible? [8]

Answer:

3. (a) Value engineering or value analysis is concerned with the improvement of design and specifications at various stages such as research, development, design and product development. Benefits of value engineering are:
(i) Cost reduction.
(ii) Less complex products.
(iii) Use of standard parts / components.
(iv) Improvement in functions of the product.
(v) Better job design and job safety.
(vi) Better maintainability and serviceability.
(vii) Robust design.
Value engineering aims at cost reduction at equivalent performance. It can reduce costs to the extent of 15% to 70% without reducing quality. While value engineering focuses on preproduction design improvement, value analysis, a related technique seeks improvements during the production process.

(b) Total demand 98. Total supply 76. Introduce dummy source with supply as 22 and transportation cost per unit to be zero.

	Store 1	Store 2	Store 3	Store 4	Total supplies
Source 1	~~48~~	~~60~~	~~56~~ 14	~~58~~	~~14~~
Source 2	~~45~~ 20	~~55~~	~~53~~ 6	~~60~~	~~26~~
Source 3	50	65 10	60 5	62 21	36
Source 4	~~0~~	~~0~~ 22	~~0~~	~~0~~	~~22~~
Total Demand	20	32	25	21	98

Initial Solution

From	Source 1	Source 2	Source 2	Source 2	Source 3	Source 3	Source 4
To	Store 3	Store 1	Store 3	Store 2	Store 3	Store 4	Store 2
Units	14	20	6	10	5	21	Dummy
Feasibility test		m + n – 1 = 7		No. of allocations = 7		The solution is feasible	

4. (a) What does sigma value indicates? [2]

(b) The Secretary of a school is taking bids on city's four school bus routes. Four companies have made the bids as detailed in the following table:

	Bids			
	Route 1	**Route 2**	**Route 3**	**Route 4**
Company 1	**₹4000**	**₹5000**		
Company 2		**₹4000**		**₹4000**
Company 3	**₹3000**		**₹2000**	
Company 4			**₹4000**	**₹5000**

Suppose each bidder can be assigned only one route. Use the assignment model to minimize the school's cost of running the four bus routes. [10]

Answer:

4. (a) The sigma value indicates how often defects are likely to occur. The higher the sigma value, the less likely a process will produce defects. As sigma value increases, costs go down, cycle time goes down, and customer satisfaction goes up.

(b)

	Bids			
	Route 1	Route 2	Route 3	Route 4
Company 1	₹4000	₹5000	M	M
Company 2	M	₹4000	M	₹4000
Company 3	₹3000	M	₹2000	M
Company 4	M	M	₹4000	₹5000

Row reduction

	Route 1	Route 2	Route 3	Route 4
Company 1	0	1000	M - 4000	M - 4000
Company 2	M - 4000	0	M - 4000	0
Company 3	1000	M - 2000	0	M - 2000
Company 4	M - 4000	M - 4000	0	1000

Column reduction is not required as there is zero in each column.
Minimum lines to cut zeros

	Route 1	Route 2	Route 3	Route 4
Company 1	~~0~~	~~1000~~	~~M - 4000~~	~~M - 4000~~
Company 2	~~M - 4000~~	~~0~~	~~M - 4000~~	~~0~~
Company 3	1000	M - 2000	0	M - 2000
Company 4	M - 4000	M - 4000	0	1000

As the minimum number of lines are not equal to order of matrix, let's take step to increase the number of zeros.

	Route 1	Route 2	Route 3	Route 4
Company 1	0	1000	M - 3000	M - 4000
Company 2	M - 4000	0	M - 3000	0
Company 3	0	M - 3000	0	M - 3000
Company 4	M - 5000	M - 5000	0	0

Minimum lines to cut zeros

	Route 1	Route 2	Route 3	Route 4
Company 1	0	1000	M - 3000	M - 4000
Company 2	M - 4000	0	M - 3000	0

Company 3	0	M - 3000	0	M - 3000
Company 4	M - 5000	M - 5000	0	0

As the minimum number of lines are equal to order of matrix, optimal assignment should be made

Optimal Assignment

	Route 1	Route 2	Route 3	Route 4
Company 1	[0]	1000	M - 3000	M - 4000
Company 2	~~M - 4000~~	[0]	~~M - 3000~~	~~0~~
Company 3	0	M - 3000	[0]	M - 3000
Company 4	M - 5000	M - 5000	0	[0]

Company	1	2	3	4	
Route	1	2	3	4	
Cost	4000	4000	2000	5000	Total cost ₹15,000

5. (a) The output of production line is checked by an inspector for one or more of three different types of defects A, B, and C. If defect A occurs, the item is scrapped. If defect B or C occurs, the item must be reworked. The time required to rework a B defect is 15 minutes and the time required to rework a C defect is 30 minutes. The probabilities of an A, B and C defects are 0.15, 0.20 and 0.10 respectively. For ten items coming off the assembly line, determine the number of items without any defects, the number scrapped and total minutes of rework time. Use the following random numbers:

RN for defects A:

48	**55**	**91**	**40**	**93**	**01**	**83**	**63**	**47**	**52**

RN for defects B:

47	**36**	**57**	**04**	**79**	**55**	**10**	**13**	**57**	**09**

RN for defects C:

82	**95**	**18**	**96**	**20**	**84**	**56**	**11**	**52**	**03**

[3+3+3]

(b) What are the basic scheduling problems the production planner may face? [3]

Answer:

5. (a) Probability distribution (Defect A)

Event	Prob.	Cum. Prob.	Probability range	Probability range for simulation
Defect	0.15	0.15	0-0.15	0-0.14
No defect	0.85	1.00	0.15-1.00	0.15-0.99

Probability distribution (Defect B)

Event	Prob.	Cum. Prob.	Probability range	Probability range for simulation
Defect	0.20	0.20	0-0.20	0-0.19
No defect	0.80	1.00	0.20-1.00	0.20-0.99

Probability distribution (Defect C)

Event	Prob.	Cum. Prob.	Probability range	Probability range for simulation
Defect	0.10	0.10	0-0.10	0-0.09
No defect	0.90	1.00	0.10-1.00	0.10-0.99

Item	Defect A	Defect B	Defect C	Rework time
1	No	No	No	
2	No	No	No	
3	No	No	No	
4	No	Yes	No	15m
5	No	No	No	
6	Yes	No	No	
7	No	Yes	No	15m
8	No	Yes	No	15m
9	No	No	No	
10	No	Yes	Yes	15m + 30m
			90m	

No. of defect items : 5	Scrap : 1 (Item No. 6)	Rework : 4

(b) **Basic Scheduling Problems:**

The production planner may face certain problems while preparing production plans or Schedules. Some important problems are discussed below:

(a) Flow production scheduling for fluctuating demand (known smoothening problem),
(b) Batch production scheduling, when products are manufactured consecutively,
(c) The assignment problem,
(d) Scheduling orders with random arrivals and
(e) Product sequencing.

6. (a) The data on the operating costs per year and resale prices of equipment A whose purchase price is ₹10,000 are given below:

Year	1	2	3	4	5	6	7
Operating Cost (₹)	1500	1900	2300	2900	3600	4500	5500
Resale Value (₹)	5000	2500	1250	600	400	400	400

(i) What is the optimum period for replacement?

(ii) When equipment A is 2 years old, equipment B, which is a new model for the same usage, is available. The optimum period for replacement is 4 years with an average cost of ₹3600. Should you change equipment A with that of B? If so, when? [5+3]

(b) What is TPM? What are the requirements for specific actions of TPM? [4]

Answer:

6. (a) (i) The determination of the optimal period of replacement of equipment A is given in Table below:

Table: Determination of Optimal Replacement Period

Year	Operating Cost (A)	Cum. Operating Cost (B)	Purchase Price – Resale Value (C)	T(n) (B+C)=D	A(n) (D / Years)
1	1500	1500	5000	6500	6500.0
2	1900	3400	7500	10900	5450.0
3	2300	5700	8750	14450	4816.7

4	2900	8600	9400	18000	4500.0
5	3600	12200	9600	21800	4360.0*
6	4500	16700	9600	26300	4383.3
7	5500	22200	9600	31800	4542.9

Since the average cost corresponding to the 5-yearly period is the least, the optimal period for replacement = 5 years.

(ii) As the minimum average cost for equipment B is smaller than that for equipment A, it is prudent to change the equipment. To decide the time of change, we would determine the cost of keeping the equipment in its 3rd, 4th and 5th year of life and compare each of these values with ₹ 3,600 (the average cost for equipment B). The equipment A shall be held as long as the marginal cost of holding it would be smaller than the minimum average cost for equipment B. The calculations are given here:

Year	Operating Cost	Depreciation	Total Cost
3	2300	1250(=2500-1250)	3550
4	2900	650 (=1250-600)	3550
5	3600	200(=600-400)	3800

Since the cost incurred in keeping the equipment A in the third and the fourth years is less than the average cost for equipment B, the replacement should be done after 2 years.

(b) Total Productive Maintenance (TPM) is an approach which brings the concept of total quality management in the practice of preventive maintenance. It involves the concept of reducing variability through employee involvement and excellent maintenance records.

Total productive maintenance is a method designed to eliminate the losses caused by breakdown of machines and equipments by identifying and attacking all causes of equipment breakdowns and system down-time. It places a high value on teamwork, consensus building and continuous improvement.

Specific actions of TPM require the following:

(i) restoring equipment to a like-new condition,
(ii) having operators involved in the maintenance of the equipment or machine,
(iii) improving maintenance efficiency and effectiveness,
(iv) training the labour force to improve their job skills,
(v) the effective use of preventive and predictive maintenance technology.

Section B(40 Marks)
Information System
Answer Question No. 7 (carrying 8 marks) which is compulsory and answer any four (carrying 8 marks each) from the rest in this Section.

7. (a) Define the term Case Tools. [2]
(b) Section 66F of Information Technology Amendment Act 2008 deals with …… [1]
(iii) ……. are the largest ERP Solution provider. [1]
(iv) Define the term Meta Data. [2]
(v) What is probabilistic system? [2]

Answer:

7. (a) **Case Tools:** CASE (Computer-Aided-Software Engineering) refers to the automation of anything that humans do to develop systems and support virtually all phases of traditional system development process. These can be used to create internally requirements specifications with graphic generators and using of specifications languages. The various CASE tools are menu generator, screen generator, report generator and code generator.
   (b) Section 66F of Information Technology Amendment Act 2008 deals with Cyber Terrorism.
   (c) SAP are the largest ERP Solution provider.
   (d) Meta data or 'data about data' is used to inform operators and users of the data warehouse about its status and the information held within the data warehouse.
   (e) The probabilistic system can be described in terms of probable behavior, but a certain degree of error is always attached to the prediction. Where a set of instructions given to a human who, for a variety of reasons, may not follow the instructions exactly as given. Forecasting is also a Probabilistic system.

8. (a) What is Integration Testing? How is it carried out? [3]
(b) What are the factors upon which the "Make or Buy" decision of an application software depends? [5]

Answer:

8. (a) Integration Testing

Integration testing is an activity of software testing in which individual software modules are combined and tested as a group. This is carried out in the following manner:

- Bottom-up Integration: It consists of unit testing, followed by sub-system testing, and then testing of the entire system. The disadvantage is that testing of major decision/control points is deferred to a later period. In this testing it starts from the bottom-up and then it tests the entire system.
- Top-down Integration: Once the main module testing is complete, stubs are substituted with real modules one by one, and these modules are tested. Stubs are the incomplete portion of a program code that is put under a function in order to push the function.
- Regression Testing: As the software change, each time a new module is added as part of integration testing, the software changes. In the context of the integration testing, the regression tests ensure that changes or corrections have not introduced new errors.

(b) The factors upon which "Make or Buy" decision of an application software depends:

(a) Availability of skilled manpower: If sufficient number of programmers is not available, the organization may purchase packages.
(b) Cost of programming: If the cost of developing the software is more than the price of pre-written software, the organization may decide to buy the software.
(c) Suitability of software: Many times the available software may not be suitable for the particular needs of the organization. Hence, it may be better to develop software in such instances.
(d) Time frame available for implementation: If the time available for implementation of the new computerized system is very short, the organization may go for buying the software.
(e) Availability of sophisticated software: In many instances, the programs available for purchase are more sophisticated than the organization would probably develop.

For example, many of the applications programs are fully integrated with other-application programs. This integration forces for purchasing rather than developing programs.

9. (a) State when DBMS should not be used? [4]
(b) Explain the different types of Database backups. [4]

Answer:

9. (a) When Not to Use a DBMS

In spite of the advantages of using a DBMS, there are a few situations in which such a system may involve unnecessary overhead costs as that would not be incurred in traditional file processing. The overhead costs of using a DBMS are due to the following:

- High initial investment in hardware, software, and training.
- Generality that a DBMS provides for defining and processing data.
- Overhead for providing security, concurrency control, recovery, and integrity functions.

Additional problems may arise if the database designers and DBA do not properly design the database or if the database systems applications are not implemented properly. Hence, it may be more desirable to use regular files under the following circumstances:

- The database and applications are simple, well defined, and not expected to change.
- There are stringent real-time requirements for some programs that may not be met because of DBMS overhead.
- Multiple-user access to data is not required.

(b) Different types of database backups are given as follows:

- **On-line backup**: It is performed by executing the command-line or from the "Backup database" utility. When an on-line backup process begins, the database engine externalizes all cached data pages kept in memory to the database file on disk. This process is called a check point. The database engine continues recording activity in the transaction log file while the database is being backed up. The log file is backed up after the backup utility finishes backing up the database. The log file contains all of the transactions recorded since the last database backup. For this reason the log file from an on-line full backup must be applied to the database during recovery.
- **Live backup:** A live backup is carried out by using the BACKUP utility with the command-line option. A live backup provides a redundant copy of the transaction log for restart of the system on a secondary machine in the event the primary database server machine becomes unusable.
- **Full database backup:** For a full backup, the database backup utility copies the database and log. A full backup capture all files on the disk or within the folder selected for backup. With a full backup system, every backup generation contains every file in the backup set.
- **Incremental Backup:** An incremental backup uses the DBBACKUP utility to copy the transaction log file since the most recent full backup. When we perform an incremental backup, the mirror log is not backed up. When we backup and renamed the log files, the transaction and mirror logs file are renamed and a new log files are created. One must plan to manually backup the mirror log.

10. (a) What are the special features of an Executive Information System? [5]

(b) Discuss the various reporting tools available in Data Warehouse [3]

Answer:

10. (a) Following are the special features of an EIS:
- It a specially designed tool to feed executives information need.
- It is an easy - to - use and screen based software.
- It provides the executives the facilities of on-line analysis tools like time series analysis, regression analysis etc.
- It is not limited to internal data only. Access to external sources of data is also provided.
- It provides the facilities to connect to internet.
- Information is presented in summary format.
- It is a comprehensive Information System and work in conjunction with DSS.

(b) Various reporting tools available in Data Warehouse are discussed below.

(i) **Business Intelligence tools:** These are software applications that simplify the process of development and production of business reports based on warehousing data.

(ii) **Executive Information System tools:** These are software applications that are used to display complex business metrics and information in a graphical way to allow rapid understanding of the overall process.

(iii) **Online Analytical Processing (OLAP) tools:** They form data into logical multi-dimensional structures and allow users to select dimensions to view data.

(iv) **Data Mining tools:** They are software that allows users to perform detailed mathematical and statistical calculations on detailed warehousing data to detect trends, identify patterns and analyze data.

11. (a) Discuss the tangible and intangible benefits of ERP [3+3]
(b) Define the Master Data Management of an ERP System. [2]

Answer:

11. (a) **Tangible and Intangibles benefits of ERP**

Some of the quantifiable and tangible benefits of ERP system are mentioned below: Implementation of ERP, however, does not lead to headcount reduction (redundancies of few lower ended positions of payroll and accounts payable gets counterbalanced by additional higher paid IT staff).

(i) Reduced level of inventory, including raw material, work in progress and finished goods, through improved planning and control.

(ii) Reduced materials cost through improved procurement and accounts payable practices, less obsolescence and wastage.

(iii) Reduced labor cost through better allocation and reduction of overtime of workmen directly involved with production such as technicians and skilled workers.

(iv) Improved production throughput through better scheduling of critical equipment and sub contracting operations, thereby minimizing shortages, interruption and rework.

(v) Reduction in the cost of after sales services.

In addition to tangible benefits, following intangible benefits also occur:

(i) Integration of information resulting efficiency, transparency and effective MIS.

(ii) Error reduction, accuracy of inventory record.

(iii) Improved customer service, on time shipment, shorter order to shipment cycle.
(iv) Establishment of standardized procedures.
(v) Improved accounting control and shorter sales to cash cycle.
(vi) Legal and regulatory compliance.

(b) **Master Data Management of an ERP System:**
ERP packages contain several modules, such as finance, sales and distribution, materials management, manufacturing and production control, human resources, plant maintenance and quality management. Main characteristics of ERP system is that all its modules function in an integrated manner. Due to integrated nature of functioning, a few master tables are referenced frequently all across the system and databases, and shared by different applications, functional areas and sites. Data incorporated thereon need to be accurate, complete, timely and consistent. The quality of data as inputted in master tables, is a major reason for success or otherwise of an ERP system.

12. (a) Describe the constitution and power of Cyber Appellate Tribunal. [2+3]
(b) Explain different dimensions of E-commerce security [3]

Answer:

12. (a) Constitution
The composition of the Cyber Appellate Tribunal is provided for under section 49 of the Information Technology Act, 2000. Initially the Tribunal consisted of only one person who was referred to as the Presiding Officer who was to be appointed by way of notification by the Central Government. Thereafter the Act was amended in the year 2008 by which section 49 which provides for the composition of the Cyber Appellate Tribunal has been changed. As per the amended section the Tribunal shall consist of a Chairperson and such number of other Members as the Central Government may by notification in the Official Gazette appoint. The selection of the Chairperson and Members of the Tribunal is made by the Central Government in consultation with the Chief Justice of India. The Presiding Officer of the Tribunal is now known as the Chairperson.

Some of the powers specified are following:
(i) Summoning and enforcing the attendance of any person and examining him on oath.
(ii) Requiring production of documents and other electronic records.
(iii) Receiving evidence on affidavits
(iv) Reviewing its decisions.
(v) Issuing commissions for examination of witness etc.

(b) The different dimensions of E-commerce security are as follows:
- Integrity – The ability to ensure that information being displayed on a web site or transmitted or received over the internet has not been altered in any way by an unauthorized party.
- Non-repudiation – The ability to ensure that e-commerce participants do not deny (i.e., repudiate) their online actions.
- Authenticity – The ability to identify the identity of a person or entity with whom we are dealing in the internet.
- Confidentiality – The ability to ensure that messages and data are available only to those who are authorized to view them.
- Privacy – The ability to control the use of information about oneself.

- Availability - The ability to ensure that an e-commerce site continues to function as intended.