



**MADE EASY**

India's Best Institute for IES, GATE & PSUs

## RPSC Main Exam 2019 : Test Series

### Assistant Engineer

#### Social Aspects of Engineering

### Compulsory Subject : Paper-II

**Test No. 6** | Date of Exam. : 28-07-2019 (9 AM to 12 Noon)

#### Part-A

1. Factor cost means the cost of production that the producers or service providers have incurred after removing the effect of indirect taxes or subsidies.
2. Countervailing Duty is imposed on imported goods to counterbalance provided by the exporter country.
3. Gender Budgeting is a method of planning, programming and budgeting that helps advance gender equality and women's rights.
4. **Slack:** Slack is defined as the difference between latest allowable time ( $T_L$ ) and earliest expected time ( $T_E$ ) of an event.  
Slack for any event  $j = T_L^j - T_E^j$   
Slack for any event  $i = T_L^i - T_E^i$
5. Graphical evaluation and review techniques are similar to PERT but have the distinct advantages of allowing for looping, branching and multiple project end results.
6. Centre for Science and Environment (CSE)
7. Contour Bunding or contour farming or Contour ploughing is the farming practice of plowing and/or planting across a slope following its elevation contour lines.
8. The Tidal Range is expressed as the difference in water levels between two consecutive high tides and low tides.

9. Agricultural Drought or soil moisture drought is characterized by the low soil moisture that is necessary to support the crops thereby resulting in crop failure.
10. Laissez-faire is an economic theory from the 18<sup>th</sup> century that opposed any government intervention in industrial relations. The workers and employers were left alone to manage their affairs.
11. It is a second information system provides data on risk management. The Risk Management Information System (RMIS) stores and allows retrieval of risk-related data. It provides data for creating reports and serves as the repository for all current and historical information related to project risk.
12. **Earnest Money Deposit (EMD):**
  - It is the amount to be deposited by all the tenderers when they submit their tender. The EMD amount varies from 1% to 3% of the tender value. Once the contract is finalized, the EMD remitted by all the unsuccessful tenderers are returned back. The EMD of the successful tenderer is retained as a measure of caution so that he will not withdraw his offer.
13. Non-Biodegradable pollutants refer to those substances which cannot be degraded by natural processes (decomposition by Saprophytes). They are a threat to environment. Plastic is one of the major non-biodegradable pollutant.
14. SAFAR (System of Air Quality and Weather Forecasting) System measures sun's UV-Index (UVI), PM1, Mercury and Black carbon in real time in addition to regular air quality and weather parameters like PM2.5, PM10, Sulphur Dioxide, Ozone, Nitrogen Oxides, Carbon Monoxide.
15. Green Muffler is used for reducing noise pollution by planting 4-6 rows around the populated areas or noisy places like along roadsides, industrial areas, societies near highways, etc. so that dense trees reduce noise pollution as they filter out the noise and obstruct it reaching the citizens.
16. Substitutes of Ozone Depleting Elements:
  - HFC (Hydrofluorocarbon)
  - PFC (Perfluorocarbon)
  - NF3 (Nitrogen Trifluoride)
  - SF6 (Sulphur Hexafluoride)
17. A collective agreement is an agreement in writing between an employer and the trade union representing employees of the employer which contains provisions respecting conditions of employment, rates of pay, hours of work, and the rights and obligations of the parties to the agreement.
18. Right Arbitration referred to as "Grievance" arbitration. It occurs where a difference arises between the parties relative to the interpretation, application or to the administration a collective agreement.
19. A strike is a cessation of work, a refusal to work or to continue work by employees in combination or in concert with a common understanding on the part of employees designed to restrict or limit production for the purpose of compelling an employer to agree to terms or conditions of employment.
20. The Internet of Things is the internet working of physical devices, building and other items embedded with electronics.

**Part-B**

21. Pro-Active Governance and Timely implementation are an ambitious multi-purpose and multi-modal platform. PRAGATI is a unique integrating and interactive platform. This platform is aimed at addressing common man's grievances and simultaneously monitoring and reviewing important plans and programs of Government of India.
22. Resource management is the efficient and effective development of an organisation's resources when they are needed.
- During planning stage, we generally assume that sufficient resources are allocated to perform the various activities and complete the project. But in reality resources are always limited, and this limitation of resource significantly affect the start, performance and completion of activities on scheduled time. It is observed that resource availability fluctuate from very high at one time to very low at other time during a year.
- Therefore, various activities of project should be scheduled in such a way that the demand for various resources is more or less uniform during the project duration. This can be achieved by following two approaches:
1. **Resource Smoothing:** In this method the starting or finishing of activities are delayed by their available total float in such a way that uniform demand of resources is created for the entire project duration. In this case, there is no limitation on the availability of resources.
  2. **Resource levelling:** In this method the activities are rescheduled in such a way that peak requirement of the resource is less than or equal to maximum available resource at that time.
23. A bar chart has following deficiencies:
- It can only be used for small and simple project.
  - It is used only for project that are repetitive in nature.
  - As bar chart lacks in showing project progress. It makes controlling of project with bar chart difficult.
  - In bar chart sub-activities of an activity can not be represented, so bar chart lacks in degree of details.
  - Interdependencies between the activities can not be depicted in bar chart.
  - Critical and non-critical activities are not separated by use of bar chart.
24. Blending of bio-fuel in mineral diesel has following benefits:
- Reduction in dependency on huge oil imports.
  - Reduction of greenhouse gas (carbon dioxide, SO<sub>x</sub>, NO<sub>x</sub>, etc.) emissions and reduction of diesel oil consumption.
  - Creation of job opportunities for local people by construction and operation of bio-fuel plant and production of Jatropha thus increase in income local tribes.
  - Development of local area by development of Jatropha farmlands and incidental infrastructure such as roads etc.
  - Acquisition and dissemination of know how and skills from local university agricultural departments and related agencies to locals regarding plantation of Jatropha.

25. It is the process of transferring skills, knowledge technology, method of manufacturing, samples of manufacturing and facilities among governments or universities and other institutions to ensure that scientific and technological developments are accessible to a wider range of users who can then further develop and exploit the technology into new product.
26. The main aspects of Industrial Relations are:
- **Labour Relations:** relation between union and management.
  - **Employer-employee's relations:** relations between management and employees.
  - **Group relations:** relations between various groups of workmen.
  - **Community or Public relations:** Relations between industries and society.
  - Promotion and development of healthy labour-managements relations.
  - Maintenance of industrial peace and avoidance of industrial strike.
  - Development of true industrial democracy.
27. • Rainwater Harvesting is a technique of collection and storage of rainwater into natural reservoirs or tanks, or the infiltration of surface water into subsurface aquifers (before it is lost as surface runoff).
- One method of rainwater harvesting is rooftop harvesting. With rooftop harvesting, any surface like tiles, metal sheets, plastics can be used to intercept the flow of rainwater and provide a household with high-quality drinking water and year-round storage. Other uses include water for gardens, livestock, and irrigation, etc.
28. Bioremediation is a waste management technique that involves the use of organisms to remove or neutralize pollutants from a contaminated site. The naturally occurring organisms are able to break down hazardous substances into less toxic or non-toxic substances.
- Advantages of bioremediation:**
- Bioremediation is less expensive environment-friendly mechanism to remove pollutants from the environment.
  - Conventional methods like mechanical removal, burial, evaporation, dispersion, and washing to remove environmental pollutants are expensive.
  - Besides, these traditional methods also can lead to incomplete decomposition, leaving residual contaminants to pollute soil and water.
29. • Sand dunes are common features of shoreline and desert environments. Dunes provide habitat for highly specialized plants and animals, including rare and endangered species. They can protect beaches from erosion and recruit sand to eroded beaches. Dunes are threatened by human activity, both intentional and unintentional.
- Dune Stabilization is a sustainable protection measure, enhancing the natural protection ability of dune areas. It protects against wave and storm surge attack and at the same time it preserves the natural coastal landscape, if performed moderately. Dune stabilization requires a planned and coordinated effort.

**30. Project Charter:**

It is first document of the project. It answers questions like who, what, whom, how.

**Benefits of Project Charter:**

- It improves and paves way for good customer relationships.
- It clearly defines the role of the project manager and stakeholders.
- Project charter also works as a tool that improves project management processes.
- By having a project charter, project sponsorship can also be gained.
- Allows progression, which is aimed at attaining industry best practices.

**31. National Agriculture Market (NAM) is a Pan-India electronic trading portal for farm produce which creates a unified national market for agricultural commodities by integrating the existing Agriculture Produce Market Committee (APMC) markets.**

This portal provides a single window service for all APMC related services and information, such as commodity arrivals and prices, provision for responding to the trade offers, buy and sell trade offers, among other services.

**32. Any material at the nanoscale is a Nano-material. A quantum dot is a nanoparticle made if any semiconductor material such as silicon, cadmium etc. Quantum dots can be used for increased efficiency solar cells, Quantum displays and in drug delivery system.****Part-C****33. Land degradation is any change in the condition of the land which reduces its productive potential. Desertification is a type of land degradation in which a relatively dry land region becomes increasingly arid, typically losing its bodies of water as well as vegetation and wildlife.****Major Reasons for Land Degradation and Desertification:**

- **Water Erosion:** Loss of soil cover due to rainfall and surface run-off.
- **Vegetation Degradation:** Deforestation, shifting cultivation and degradation in grazing grassland and scrub land.
- **Wind Erosion:** Removal of top-soil (spread of sand) due to wind especially in western part of the country.
- **Salinity:** Cultivated lands especially in irrigated areas with improper drainage.
- **Human made/Settlements:** Developmental activities such as mining and unplanned urbanization.
- **Others:** Water logging, frost shattering, mass movement etc.

**Measures to combat Land Degradation and Desertification:**

- In rangeland areas through grazing pressure management, pasture and forage crop improvement, Silvopastoral management, Weed and pest management, maintaining appropriate fire regimes, etc.
- In mining areas through on-site management of mining wastes, reclamation of mine site topography and early replacement of topsoil.
- In wetland areas, through controlling point and diffuse pollution sources, adopting integrated land and water management strategies and restoring wetland hydrology, biodiversity, etc.

- Shifting towards less land degrading diets and less animal protein from unsustainable sources and reductions in food loss and wastage.
- Recognizing the key role of Land managers, including indigenous peoples and local communities in the design and implementation of sustainable practices.
- Eliminating perverse incentives e.g. irrigation subsidies and devising positive incentives that reward the adoption of sustainable land management practices.

Reduction and reversal of land degradation is important not only for socio-economic gains but also for the achievement of SDGs and Paris agreement goals.

34. Post-disaster phase includes response to a disaster with a purpose to achieve early recovery and rehabilitation of affected communities, immediately after a disaster strikes. These are called as response and recovery activities.

The key elements of action in the post disaster phase of the disaster management cycle includes:

1. **Response and Relief:** It is the earliest action and immediate intervention to be taken in the post disaster phase. It includes search and rescue, ensuring security of people, providing food and water, shelter and sanitation, clothes-medical and trauma centre care.

**Importance:**

- This response is the foremost attempt to control the situations after disaster hits, to ensure the situation does not worsen further.
- It ensures that the survivors are kept alive, healthy and safe.
- It prevents the epidemics from spreading post disasters.
- It prepares the ground for further rehabilitation of people, their animals and their property.

2. **Rehabilitation:** This includes the restoration of basic services and functions after the response to the disaster.

**Importance:**

- After the security of people has been ensured, this process ensures that their lives return back to normal.
- It prepares the ground for further reconstruction and resorting back to the development that was either hampered or pushed back due to disaster.

3. **Reconstruction:** It means full resumption of services, along with reinstatement of the preventive measures in order to stay prepared for the disasters in future.

**Importance:**

- The process brings back the affected area back on the path of development.
- It facilitates creation of sustainable livelihood.
- Provides people with enlarged livelihood options and improved land, water and resources.
- Normalization of economics and trade of the region.
- Prepares community for future disaster resistance.

Natural disasters can hit any region and any community but the amount of damage it causes is totally based on the amount of preparedness and resilience of that community. After the disaster hits, it is important for that community to stand back again to normalcy and develop resilience for future disasters. It is not possible to move on without post-disaster phase of management.

35. Notified under the Environment (Protection) Act, 1986, Environment Impact Assessment (EIA) is a formal process used to predict environmental consequences of any development project such as nuclear power, river valley projects, ports, petroleum refineries, chemical fertilizers, mining etc.

**Purpose of EIA:**

- Identify the environmental, social and economic impacts of a project prior to taking a decision for its implementation.
- Mitigate the harmful impact and maximize the beneficial effects.

**Different processes involved in carrying out EIA:**

- **Screening:** First stage of EIA, which helps determine whether the proposed project requires EIA or not.
- **Scoping:** Expert identification of key issues and impacts which needs to be further investigated, along with defining boundary and time limit.
- **Impact Analysis:** Identifying and predicting likely social and environment impacts such as air quality, noise levels, impact on wildlife and local communities etc.
- **Mitigation:** Recommendation of actions so as to reduce and avoid the adverse impacts.
- Reporting to decision making body, public hearing, review of EIA and decision making.
- **Post monitoring:** After project is commissioned, this step ensures that the impacts of the projects do not exceed the mandated legal standards.

36. Line organisation is the oldest and simplest method of administrative organisation. According to this type of organisation, the authority flows from top to bottom. The line of command is carried out from top to bottom. This is the reason for calling this organisation as scalar organisation which means scalar chain of command is a part and parcel of this type of administrative organisation. In this type of organisation the line of command flows on an even basis without any gaps in communication and coordination taking place.

Features of line organisation are as follows:

- (i) It is the simplest form of organisation.
- (ii) Line of authority flows from top to bottom.
- (iii) Specialised and supportive secessions do not take place in these organisation.
- (iv) Unified control by the line officers can be maintained since they can independently take decisions in their areas and spheres.
- (v) This kind of organisation always helps in bringing efficiency in communication.

**Merits of line organisation:**

- (i) Simple to establish and easily understood by the employees.
- (ii) Identification of authority and responsibility.
- (iii) Helps in achieving effective coordination.
- (iv) Less expensive and results in quick decisions.
- (v) Unity of command.

**Demerits of line organisation:**

- (i) This results into excessive work for executives.
- (ii) This also results into lack of managerial specialisation as they have to take decision on every line.
- (iii) Lack of initiative is shown by employee at lower level.
- (iv) Favorism can arise in this type of organisation.
- (v) Instability is also an disadvantage in this type of organisation.

37. ERP is an integrated system that allows information to enter at a single point in the process and updates a single shared database for all functions that directly or indirectly depend on this information. Most of enterprise in developing countries, such as India, are in the process of implementing Enterprise Resource Planning (ERP) systems in alignment with organizational transformation and process re-engineering initiatives. ERP systems promise benefits that range from increased efficiency to translation of quality, productivity and profitability. However, its implementation pose some unexpected organizational challenges and changes that can be structural as well as cultural in nature. ERP not only help establish world class best business practices but also brings transparency to the organization. It also demands empowerment and flexibility in decision making process. We can summarise the ERP benefits as follows:

- (i) ERP facilitates a company wide integrated information system covering all functional areas such as manufacturing, sales and distribution, accounts, payables, receivables, inventory, human resources, etc.
- (ii) ERP integrates and automates most business processes and shares information enterprise-wide in real time, thereby improving customer service and the corporate image.
- (iii) ERP provides complete integration of the system not only across departments but also across companies under the same management.
- (iv) ERP in the solution for better project management.
- (v) ERP not only addresses the current requirements of the company but also provides an opportunity for improvement and refinement in the business processes on a continuous basis.

**Popular ERP Software (W-2005):** It is software that connects of a company by sharing and organizing information data. The popular ERP software are given below one by one for the convenience of readers.

- (i) **SAP (Software Package):** It is an important ERP package. Being a unique system that supports nearly all area of business on a global scale. The modules covered in SAP are financial, controlling, investment management, integrated enterprise management, sales distribution, production, planning and control and HRM (Human Resource Management).
- (ii) **SCM (Supply Chain Management):** SCM manage flow of information through the supply chain in order to attain the level of synchronization (connection like chain) which makes it more responsive to customer needs while lowering cost.



38. (i) **Government Interaction in e-Governance Government to Citizen (G2C):** G2C concept is used for expressing a delivery of public services from the government directly to the citizens. Its various initiatives include:
- Computerization of Land Records
  - Bhoomi Project
  - Gyandoot
  - e-Mitra Project in Rajasthan
- (ii) **Government to Business (G2B):** It is direct interaction between the government and business. There is no need of intermediaries, for which businesses otherwise would have incurred a significant expense. It makes business transactions transparent. It is also useful in helping businesses leverage opportunities across regions. Its various initiatives include:
- e-Procurement Project in Andhra Pradesh and Gujarat
  - MCA 21 by the Ministry of Corporate Affairs
- (iii) **Government to Government (G2G):** It involves distributing data or information between agencies, organizations or departments of government. It aims to play a supportive role for implementing e-Governance by better communication, data sharing and enabling data access. It helps bring cost-effectiveness. Its various initiatives include:
- Khajane Project in Karnataka
  - SmartGov (Andhra Pradesh)
- (iv) **Government to Employees (G2E):** It involves giving and taking of information regarding diverse work assignments as may come from time to time, evolution of performance, management policy for personnel, training and development of employees, and career advice. Exchange of information happens online among different organizations, discussion forums, and agencies to enable employees to get the maximum benefit. Its various initiatives include:
- Employees E-mail policy
  - Health information the mobile based Central Government Health Services provided to their employees.
38. **Polar Satellite Launch Vehicle (PSLV):**
- The Polar Satellite Launch Vehicle (PSLV) has proved itself to be a versatile vehicle for diverse missions and is now the workhorse of ISRO. PSLV is meeting the national requirements as well as the launch requirements for international customers. The long string of consecutive successes and multi-satellite launch capability has reinforced the status of PSLV as a reliable, versatile and affordable launcher in the global market. Over the years, continual technological improvements have enhanced the payload capability to 1700 kg into 600 km Sun Synchronous Polar Orbit (SSPO) and 1425 kg into Sub Geo-Synchronous Transfer Orbit of 284 km × 20650 km. The fact that PSLV was used to place Chandrayaan-1 in India's first lunar mission and Mangalyaan in India's first Mars orbiter Mission, is a testimony to its reliability and versatility.

**PSLV Variant:**

- **PSLV CA (PSLV-core alone):** It is an advanced version of the PSLV. It carries 400 kg less propellant than the standard model and can launch 1100 kg of payload to SSO.
- **PSLV-XL:** XL Variant of PSLV rocket standing 44.4 metres tall and weighing 320 tonnes. It incorporated with six strap on motors to carry 4000 kg more propellant compared with the standard PSLV.

