

Booklet

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RPSC

Rajasthan Public Service Commission

Social Aspects of Engineering

As per the **Latest Syllabus** of RPSC-AE

Key Features: Includes

- ☞ Theory with Detailed Explained Question
- ☞ Topic wise Segregation
- ☞ Including Previous Year Questions with Solution

Social Aspects of Engineering

RPSC A.En Mains Compulsory Paper

**Include
1.5, 2.5 & 8 Marks Solved
Practice Problems**



Head Office : F-26/A, Behind Honda Pinkcity Showroom, Gatta Stand, Tonk Road, Jaipur

Phone : 9828747676, 9462447676

Email : zonetechjaipur@gmail.com / info@zonetech.in

Website : www.zonetech.in



Contact Us

Corporate Office : F-26/A, Behind Honda Pinkcity Showroom, Gatta Stand,
Tonk Road, Jaipur (Rajasthan) - 302019

Email : info@zonetech.in

Facebook : www.facebook.com/zonetechjaipur

Website : www.zonetech.in

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Contact us : +91-9828747676, +91-9462447676

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Director's Message

This **Social Aspects of Engineering** book is designed as per the latest syllabus of **RPSC Assistant Engineer Examination**. This book contains adequate amount of study material which is very much helpful for all the Aspirant of RPSC Assistant Engineer Examination. In real this book is the best guide to get success in the respected examination.

As the competition and number of competitors are going increasing day by day and a wide range of questions asked in examinations, hence main objective of this book is to help the student to enhance their skills and to crack the examination efficiently. All the chapters and variety of concepts which may be asked in various competitive exams has been covered while preparing this book.

I would like to give credit of publishing this book to **ZONE TECH** team for their hard efforts collecting such a fruitful matter. I hope that the students who are preparing for the competitive examinations will be benefitted by this book. As day by day level of exams are increasing by considering that in mind this book is been prepared by **ZONE TECH Publications**. The objective of **ZONE TECH** books are to introduce a simple approach to learn the concepts of related Topic. We hope the book will serve the purpose to succeed in various competitive examinations.

ZONE TECH extends its heartfelt gratitude to **Er. Ankur Pareek Sir** for his invaluable contributions, dedication, and effort in bringing this book to publication.

Every suggestion regarding the improvement of the book will be warmly acknowledged with thanks.

With Best Wishes
KARAN SINGH YADAV
Founder & Director
ZONE TECH

Compulsory Paper (02) – SOCIAL ASPECTS OF ENGINEERING

Maximum Marks: 100

Development Processes, Rural Economy, and Indian Ethos:

Development Processes: Inter relationship among social, economical, environmental, scientific and technological factors for development. Development criteria; Gross National Product (GNP), Gross Value Added (GVA), energy consumption, carbon footprint, carbon credit system.

- Challenges in the rural economy: Poverty, Unemployment, Malnutrition, Inadequate Sanitation, Infant Mortality, Insufficient healthcare infrastructure, Exodus to urban areas. Deforestation, Land acquisition.
- Technology catering to the needs of Rural and Desert Areas: Sustainable Water Management and Irrigation, viz Drip Irrigation Systems, Rainwater Harvesting, Solar-Powered Desalination; Renewable Energy Solutions viz Solar Power, Wind Power, Biogas Systems; Agricultural Innovations viz Precision Agriculture, Climate-Resilient Seeds, Agro-forestry. Soil and water conservation, water harvesting, watershed planning. Thermal comfort aspects of housing Transport in rural and desert areas, Drought, Famine and Disaster management. Desertification, Sand Dunes Stabilization.
- **Indian Ethos in Development:** Concepts of ‘Sarvodaya’ (welfare for all), ‘Antyodaya’ (Last mile delivery) and ‘Swadeshi’ (self-reliance) in rural development.
- Promotion of Human values viz. **Empathy, Dignity, Fraternity, Harmony, Integrity, Honesty, Probity and Universal Accommodation.**

Globalization, Economic Growth, Industry 4.0, and Sustainable Infrastructure:

Globalisation of Economy: World Trade Organization (WTO), trade related Intellectual Property Rights (TRIPS), SDGs, Quality Management System, Optimisation of Human, Capital, Intellectual and Material resources.

- Financing methods of infrastructure projects-BOT, BOO, BLT, HAM, DBFM, PPP, Turnkey Projects etc., Case studies of recent projects in Rajasthan-Refinery, IIIT, NHAI Highway, Dedicated Freight Corridor, Metro Rail Project. Eastern Rajasthan Canal Project (ERCP), *Bharatmala* Pariyojana, PMGSY Project.
- **Role of Artificial Intelligence and Blockchain Technology in the Economic Growth of India in general and the State of Rajasthan in particular.**

- **The role of Industry 4.0's** in economic transformation of the local economy.
- **Building Sustainable Infrastructure and Smart Cities & Villages.**

Project Planning, Appraisal & Feasibility Study:

- Techno Economic Feasibility studies, Project planning and control, Use of CPM and PERT, **Resource Allocation , Resource Levelling and Resource Smoothing, Application of AI in Project Management.**
- Fixed and variable cost, IRR (Internal Rate of Return), Cost-benefit analysis, NPV (Net Present Value) Break even analysis, Depreciation, Life cycle costing. Software applications in life cycle cost analysis. Project Monitoring by SAP, Tally ERP and statistical software.

Environmental Degradation, Circular Economy, and Sustainable Development:

- Environmental degradation due to energy production, transport, industries, mining and intensive agricultural practices. Control of air, water, and noise pollution. Hazards of environmental pollution.
- Environmental Challenges owing to local industries viz Stone, Mineral processing, Textile, Cement, Coal based thermal power plants, refinery cum petrochemical complex etc. in Rajasthan.
- Bio-Diversity impediments due to indiscriminate usage of renewable resources.
- **Circular Economy:** Principles and applications of 8 R's in Indian industry (Reduce, Refuse, Reuse, Re-Purpose, Repair, Recycle Right, Remove and Rally).
- Risk mitigation, transfer and adaptation for sustainable life style for environment (LiFE).

Innovation for development of the Society:

- Development of start-up eco-system at the grass- root level.
- Engaging academia, industry and other stake holders to build innovation driven society.
- Promoting out of the box & critical thinking to prescribe solutions to address local challenges.
- Intellectual property rights to strike a balance between fostering innovation and social welfare.
- Promoting use of IT and **filling the gaps in digital divide between Rural & Urban population.**
- **Role of social media in rural development.**

↔ RPSC AE Mains Exam Pattern ↔

Paper	Subject	Maximum Marks	Duration
Paper-I	General Hindi	100	3 Hours
Paper-II	Social Aspects of Engineering	100	3 Hours
Paper-III	Civil Engineering Paper - 1	200	3 Hours
Paper-IV	Civil Engineering Paper - 2	200	3 Hours
Interview		72	

Social Aspects of Engineering

Section wise Weightage

The **Social Aspects of Engineering** paper consists of **37 questions** divided into three parts: **Part-A**, **Part-B**, and **Part-C**, with a total of **100 marks**.

✓ Part A:

- Contains **20 questions**, each carrying **1.5 marks**.
- Candidates must attempt **all 20 questions**.
- **Total Marks:** $20 \times 1.5 = 30$ marks
- **Word Limit:** Answers must not exceed **15 words**.

✓ Part B:

- Contains **12 questions**, each carrying **2.5 marks**.
- Candidates must attempt **all 12 questions**.
- **Total Marks:** $12 \times 2.5 = 30$ marks
- **Word Limit:** Answers must not exceed **50 words**.

✓ Part C:

- Contains **5 questions**, each carrying **8 marks**.
- Candidates must attempt **all 5 questions**.
- **Total Marks:** $5 \times 8 = 40$ marks
- **Word Limit:** Answers must not exceed **200 words**.

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UNIT - 1

Development Processes, Rural Economy, and Indian Ethos

1. Development Processes
2. Challenges in the rural economy
3. Technology catering to the needs of Rural and Desert Areas
4. Indian Ethos in Development
5. Promotion of Human values

Development Processes, Rural Economy, and Indian Ethos:

Development Processes: Inter relationship among social, economical, environmental, scientific and technological factors for development. Development criteria; Gross National Product (GNP), Gross Value Added (GVA), energy consumption, carbon footprint, carbon credit system.

Challenges in the rural economy: Poverty, Unemployment, Malnutrition, Inadequate Sanitation, Infant Mortality, Insufficient healthcare infrastructure, Exodus to urban areas. Deforestation, Land acquisition.

Technology catering to the needs of Rural and Desert Areas: Sustainable Water Management and Irrigation, viz Drip Irrigation Systems, Rainwater Harvesting, Solar-Powered Desalination; Renewable Energy Solutions viz Solar Power, Wind Power, Biogas Systems; Agricultural Innovations viz Precision Agriculture, Climate-Resilient Seeds, Agro-forestry. Soil and water conservation, water harvesting, watershed planning. Thermal comfort aspects of housing Transport in rural and desert areas, Drought, Famine and Disaster management. Desertification, Sand Dunes Stabilization.

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Promotion of Human values viz. **Empathy, Dignity, Fraternity, Harmony, Integrity, Honesty, Probity and Universal Accommodation.**



DEVELOPMENT PROCESS

1.5 Marks Questions

Q.1 What is development?

Sol. Development refers to the process of growth, progress, or change from one condition to another. It is also defined as the people's economic growth, along with the growth of their basic needs like education, health, lifestyle, etc

Q.2 Define Development Criteria.

Sol. Development Criteria :

Development criteria refer to the factors that are considered when evaluating the progress and improvement of a country or community. These criteria ensure that development is sustainable, equitable, and beneficial to all members of society.

2.5 Marks Questions

Q.15 What is difference between Growth and Developme

Sol.

Growth	Development
Growth refers to increase in size or other bodily changes which can be seen.	Development refers to the outcome of functioning of organs.
Growth is external in nature	Development is qualitative in nature
Growth is limited and stops at certain level of maturity	Development is a lifelong process from womb to tomb

8 Marks Questions

Q.25 Explain inter relationship between social, economic, scientific and technological factors for development.

Sol. The interrelationship between social, economic, scientific, and technological factors is crucial for development as they are deeply interconnected and influence each other in various ways:

1. Social Factors:

- **Demographics:** The demographic composition (age, education levels, gender equality) of a society influences its workforce productivity and consumer behavior.
- **Cultural Values:** Societal norms, beliefs, and values shape preferences for goods and services, as well as attitudes towards innovation and entrepreneurship.
- **Health and Education:** Access to healthcare and quality education enhance human capital, improving productivity and enabling individuals to participate more effectively in the economy.

2. Economic Factors:

- **Growth and Development:** Economic growth provides resources for investment in scientific research and technological innovation, driving overall development.
- **Income Distribution:** Economic policies affect income distribution, impacting social mobility, poverty levels, and access to opportunities.
- **Market Forces:** Demand for goods and services influences technological advancements and scientific research priorities, guiding investment decisions.

3. Scientific Factors:

- **Research and Development (R&D):** Scientific discoveries and innovations drive technological advancements, leading to new products, processes, and industries.
- **Knowledge Base:** Accumulated scientific knowledge expands the frontier of technological possibilities, enhancing economic productivity and societal well-being.
- **Collaboration:** Interdisciplinary collaboration between scientists, engineers, and social scientists can lead to innovations that address complex societal challenges.



4. Technological Factors:

- Technological Innovation: Advances in technology improve efficiency, reduce costs, and create new opportunities for economic growth and social development.
- Digitalization: Adoption of digital technologies enhances connectivity, facilitates e-commerce, and improves access to information and services.
- Technological Disruption: Disruptive technologies can transform industries, create new markets, and reshape social dynamics, requiring adaptation and policy responses. • If a company exceeds its emission limit, it must buy carbon credits from others or invest in carbon offset projects (like afforestation or renewable energy).

Types of Carbon Markets:

1. Compliance Market - Regulated by governments (e.g., EU Emissions Trading System (EU ETS), China's Carbon Market).
2. Voluntary Market - Companies and individuals purchase credits voluntarily to offset their emissions (e.g., carbon offsets for flights, businesses, or events).

Benefits of Carbon Credits:

- Encourages industries to reduce emissions.
- Promotes investment in green technologies.
- Supports afforestation, renewable energy, and carbon capture projects.
- Helps in achieving global climate goals (e.g., Paris Agreement targets).

However, challenges like price volatility, carbon credit fraud, and lack of global standardization remain. Successful implementation requires strict regulations and transparency.

