

---

# Contents

---

<b>Preface</b> . . . . .	xi
<b>Chapter 1. Basics of Disaster</b> . . . . .	1
1.1. Understanding the concept and meaning of disaster . . . . .	1
1.2. Classification of disasters . . . . .	2
1.2.1. Other categories of disasters . . . . .	3
1.3. Aggravating factors of disasters. . . . .	4
1.4. Impact of disasters. . . . .	5
1.5. Hazard meaning and concept . . . . .	6
1.6. Types of hazards. . . . .	7
1.6.1. Other types of hazards . . . . .	8
1.7. Characteristic features of hazard/disaster . . . . .	8
1.8. Disaster management terminology . . . . .	9
1.9. Vulnerability . . . . .	11
1.10. Types of vulnerability . . . . .	12
1.11. Disaster management: meaning and concept . . . . .	13
1.12. Role of different agencies in disaster management. . . . .	14
1.13. Modern management of disasters . . . . .	15
1.14. Disaster risk reduction. . . . .	16
1.15. Applications of information technology in DRR . . . . .	17
1.16. Application of GIS in DRR. . . . .	18
1.17. Disaster management cycle. . . . .	19
1.18. Disaster Management Act . . . . .	20
1.18.1. Chapters of Disaster Management Act, 2005. . . . .	21
1.18.2. Disaster Management Act, 2005 framework . . . . .	21

---

1.19. Disaster preparedness plan . . . . .	22
1.20. Questions . . . . .	23
1.21. Multiple-choice questions (MCQs) . . . . .	25
<b>Chapter 2. Understanding Natural Disasters . . . . .</b>	<b>37</b>
2.1. Earthquakes. . . . .	38
2.1.1. Meaning and concept. . . . .	38
2.1.2. Earthquake-related terms . . . . .	39
2.1.3. Types of earthquakes. . . . .	41
2.1.4. Causes of earthquakes . . . . .	42
2.1.5. Types of plate boundaries . . . . .	43
2.1.6. Earthquake risk zones of India . . . . .	43
2.1.7. Some damaging earthquakes in India . . . . .	45
2.1.8. Effects of earthquakes . . . . .	46
2.1.9. Preparedness and mitigation measures . . . . .	47
2.2. Floods . . . . .	49
2.2.1. Meaning and concept. . . . .	49
2.2.2. Types of floods . . . . .	50
2.2.3. Causes of floods. . . . .	51
2.2.4. Flood-prone regions of India . . . . .	52
2.2.5. Worst flood disasters in India. . . . .	53
2.2.6. Impact of floods. . . . .	55
2.2.7. Mitigation measures for floods . . . . .	56
2.3. Landslides. . . . .	58
2.3.1. Meaning and concept. . . . .	58
2.3.2. Types of landslides . . . . .	60
2.3.3. Causes of landslides . . . . .	61
2.3.4. Landslide-prone regions of India. . . . .	63
2.3.5. Effects of landslides . . . . .	63
2.3.6. Mitigation measures of landslides . . . . .	64
2.3.7. Safety tips . . . . .	66
2.4. Cyclones . . . . .	67
2.4.1. Introduction to cyclones . . . . .	67
2.4.2. Types of cyclones. . . . .	69
2.4.3. Conditions for formation of cyclones . . . . .	69
2.4.4. Cyclone-prone regions. . . . .	70
2.4.5. Recent case studies of cyclones . . . . .	71
2.4.6. Effects of cyclones . . . . .	73
2.4.7. Mitigation and preparedness . . . . .	73
2.4.8. Cyclone warning system. . . . .	76

---

2.5. Tsunamis . . . . .	78
2.5.1. Meaning and concept. . . . .	78
2.5.2. Causes of tsunamis . . . . .	79
2.5.3. Case studies of tsunamis. . . . .	79
2.5.4. Effects of tsunamis . . . . .	80
2.5.5. Mitigation and preparedness . . . . .	81
2.5.6. Safety tips . . . . .	82
2.6. Volcanic eruptions. . . . .	83
2.6.1. Meaning and concept. . . . .	83
2.6.2. Classification of volcanoes . . . . .	84
2.6.3. Causes of volcanic eruptions . . . . .	86
2.6.4. Vulnerable areas . . . . .	87
2.6.5. Effects of volcanic eruptions . . . . .	87
2.6.6. Mitigation measures or risk reduction measures. . . . .	89
2.6.7. Safety tips . . . . .	90
2.7. Wildfires . . . . .	91
2.7.1. Meaning and concept. . . . .	91
2.7.2. Types of wildfires . . . . .	93
2.7.3. Causes of wildfires . . . . .	93
2.7.4. Forest fire prone regions of India . . . . .	95
2.7.5. Impact of wildfires . . . . .	95
2.7.6. Mitigation measures . . . . .	96
2.8. Droughts . . . . .	97
2.8.1. Meaning and nature . . . . .	97
2.8.2. Types of droughts. . . . .	99
2.8.3. Causes of droughts . . . . .	100
2.8.4. Drought-prone regions of India. . . . .	101
2.8.5. Impact of droughts . . . . .	102
2.8.6. Drought management . . . . .	104
2.9. Snow avalanches. . . . .	106
2.9.1. Meaning and concept. . . . .	106
2.9.2. Types of snow avalanches. . . . .	107
2.9.3. Causes of snow avalanches . . . . .	108
2.9.4. Snow avalanche-prone regions of India. . . . .	110
2.9.5. Effects of snow avalanches . . . . .	111
2.9.6. Preparedness and mitigation measures . . . . .	112
2.10. Questions . . . . .	113
2.11. Multiple-choice questions (MCQs) . . . . .	114

---

<b>Chapter 3. Human-induced Disasters</b> . . . . .	131
3.1. Transportation disasters . . . . .	132
3.1.1. Meaning and concept. . . . .	132
3.1.2. Causes of transportation disasters . . . . .	133
3.1.3. Effects of transport disasters . . . . .	133
3.1.4. Control measures of transportation disasters. . . . .	134
3.1.5. Road safety tips . . . . .	135
3.2. Urban fires . . . . .	137
3.2.1. Meaning and concept. . . . .	137
3.2.2. Causes of urban fires . . . . .	138
3.2.3. Effects of urban fires . . . . .	139
3.2.4. Mitigation measures of urban fires. . . . .	140
3.3. Biological disasters . . . . .	142
3.3.1. Meaning and nature . . . . .	142
3.3.2. NDMA guidelines for management of biohazards . . . . .	144
3.3.3. Impact of biological hazards . . . . .	145
3.3.4. Response and management . . . . .	145
3.4. Nuclear (radiation) disasters . . . . .	146
3.4.1. Meaning and concept. . . . .	146
3.4.2. Causes of nuclear disasters . . . . .	147
3.4.3. Some notable major nuclear disasters . . . . .	149
3.4.4. Impact of nuclear disasters . . . . .	149
3.4.5. Mitigation measures . . . . .	150
3.4.6. Safety measures for nuclear hazards. . . . .	151
3.5. Chemical disaster . . . . .	153
3.5.1. Meaning and concept. . . . .	153
3.5.2. Causes of chemical disasters . . . . .	154
3.5.3. Some of the worst chemical disasters . . . . .	155
3.5.4. Impact of chemical disasters . . . . .	156
3.5.5. Prevention and mitigation. . . . .	157
3.6. Technological disasters . . . . .	158
3.6.1. Meaning and concept. . . . .	158
3.6.2. Causes of technological disasters . . . . .	159
3.6.3. Impact of technological disasters. . . . .	160
3.6.4. Mitigation measures of technological disasters . . . . .	161
3.7. Questions . . . . .	163
3.8. Multiple-choice questions (MCQs). . . . .	165

---

<b>Chapter 4. Pollutions</b> . . . . .	173
4.1. Meaning and concept . . . . .	173
4.2. Air pollution . . . . .	174
4.2.1. Meaning and concept. . . . .	174
4.2.2. Sources of air pollution . . . . .	175
4.2.3. Effects of air pollution . . . . .	176
4.2.4. Control measures of air pollution . . . . .	177
4.3. Water pollution . . . . .	178
4.3.1. Meaning and concept. . . . .	178
4.3.2. Causes of water pollution . . . . .	180
4.3.3. Effects of water pollution . . . . .	181
4.3.4. Control measures of water pollution. . . . .	182
4.4. Soil pollution . . . . .	183
4.4.1. Meaning and concept. . . . .	183
4.4.2. Causes of soil pollution . . . . .	185
4.4.3. Effects of soil pollution . . . . .	186
4.4.4. Mitigation measures of soil pollution . . . . .	186
4.5. Noise pollution. . . . .	187
4.5.1. Meaning and concept. . . . .	187
4.5.2. Causes of noise pollution . . . . .	189
4.5.3. Harmful effects of noise pollution . . . . .	189
4.5.4. Control measures of noise pollution . . . . .	190
4.6. Radioactive pollution . . . . .	191
4.6.1. Meaning and nature . . . . .	191
4.6.2. Causes of radioactive pollution. . . . .	191
4.6.3. Impact of radioactive pollution . . . . .	192
4.6.4. Radioactive waste management . . . . .	193
4.7. Plastic pollution . . . . .	194
4.7.1. Causes of plastic pollution . . . . .	194
4.7.2. Impact of plastic pollution. . . . .	195
4.7.3. Mitigation strategies . . . . .	196
4.8. Questions . . . . .	197
4.9. Multiple-choice questions (MCQs) . . . . .	199
<b>Chapter 5. Environmental Challenges</b> . . . . .	207
5.1. Climate change. . . . .	209
5.1.1. Causes of climate change . . . . .	210
5.1.2. Impact of climate change on global sustainability. . . . .	210
5.1.3. Solution to combat climate change . . . . .	211

5.2. Greenhouse effect . . . . .	213
5.2.1. Factors contributing to greenhouse effect. . . . .	214
5.2.2. Impact of greenhouse effect. . . . .	214
5.2.3. Effective strategies for reducing GHG emissions . . . . .	216
5.3. Ozone depletion . . . . .	217
5.3.1. Causes of ozone depletion. . . . .	218
5.3.2. Impact of ozone layer depletion . . . . .	218
5.3.3. Mitigation measures . . . . .	219
5.4. Global warming . . . . .	220
5.4.1. Causes of global warming. . . . .	221
5.4.2. Effects of global warming. . . . .	221
5.4.3. Control measures . . . . .	222
5.5. Desertification . . . . .	223
5.5.1. Causes of desertification. . . . .	224
5.5.2. Effects of desertification. . . . .	225
5.5.3. Solution to desertification. . . . .	226
5.6. Acid rain . . . . .	227
5.6.1. Sources of acid rain. . . . .	227
5.6.2. Effects of acid rain . . . . .	228
5.6.3. Solution to control acid rain. . . . .	229
5.7. Ocean acidification . . . . .	230
5.7.1. Impact of ocean acidification . . . . .	231
5.7.2. Mitigation and adaptation strategies . . . . .	231
5.8. Urban waterlogging . . . . .	232
5.8.1. Causes of waterlogging . . . . .	234
5.8.2. Impact of urban waterlogging . . . . .	235
5.8.3. Strategies to prevent waterlogging in urban areas . . . . .	236
5.9. Questions . . . . .	237
5.10. Multiple-choice questions (MCQs) . . . . .	240
<b>References</b> . . . . .	247
<b>Index</b> . . . . .	255